

# **HP NetServer LH 3000/LH 3000r Service Manual**



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## Notice

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Hewlett-Packard Company  
Network Server Division  
Technical Communications/MS 45SLE  
10955 Tantau Avenue  
Cupertino, CA 95014 USA

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## Audience Assumptions

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This guide is for the person who services LAN servers. Hewlett-Packard Company assumes you are qualified in the servicing of computer equipment and trained in recognizing hazards in products with hazardous energy levels and are familiar with weight and stability precautions for rack installations.

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# 1 General Information

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## Notice to Service Technicians

This is the service document for the HP NetServer LH3000 server. You also need to access the HP NetServer LH3000 Installation Guide which comes with the server and is also available on the Network Server Division WEB site and on the Information Assistant Documentation CD-ROM.

The LH3000 installation guide contains additional information on the installation process that the end users follow. Both documents are needed for complete servicing information.

## Removing Covers - Pedestal LH 3000

### **WARNING**

Before removing covers, disconnect the power cords and unplug telephone cables. If possible, shut down the operating system. Disconnect the power cords to avoid exposure to high energy levels that may cause burns when parts are short-circuited by metal objects, such as tools or jewelry. Disconnect telephone cables to avoid exposure to shock hazard from telephone ringing voltages.

Wear a grounded wrist strap and use a static-dissipating work surface when handling NetServer components. Note that the power switch does not turn off the standby power. Disconnect the power cord to turn off standby power.

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### **NOTE**

If the backlight of the LCD is on, standby power is also on.

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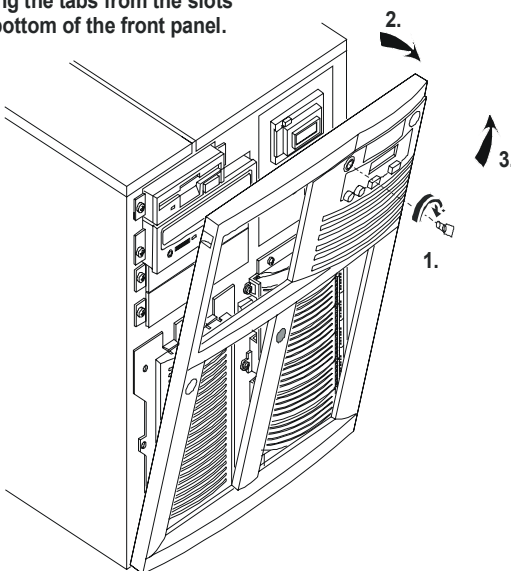
1. Unlock the bezel, using the supplied key.

The bezel connects to the chassis with two snap-in connectors inside its top left and right corners and two tabs that fit into two slots on the bottom of the chassis.

2. Remove the bezel.

- a. Pull bezel toward you until it unsnaps.
- b. Lift the bezel forward and upward from the chassis face.

Pull bezel toward you, then up and away from the front panel, releasing the tabs from the slots at the bottom of the front panel.

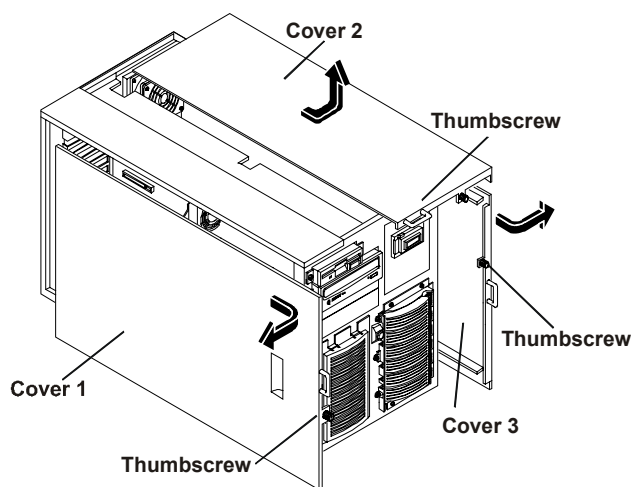


### Removing the HP NetServer LH 3000 Bezel

**CAUTION**

The NetServer covers are heavy. Support them as you remove them, and allow room to move them away from the NetServer and for storage when removed.

3. Once you have removed the bezel, remove the cover 1 by loosening the thumbscrew and then pulling the cover forward to disengage it. Lift it outward and away from the chassis.
4. Remove cover 2 by loosening the thumbscrew, pulling the cover forward and then slightly sideways to disengage it. Lift it up and away from the chassis.
5. Remove the right cover by loosening the thumbscrew and pulling the cover forward to disengage it. Lift it outward and away from the chassis.



### HP NetServer LH 3000 Covers



## Removing Covers - Rack Mount LH 3000r

**WARNING**

Before removing covers, disconnect the power cords and unplug telephone cables. If possible, shut down the operating system. Disconnect the power cords to avoid exposure to high energy levels that may cause burns when parts are short-circuited by metal objects, such as tools or jewelry. Disconnect telephone cables to avoid exposure to shock hazard from telephone ringing voltages.

Wear a grounded wrist strap and use a static-dissipating work surface when handling NetServer components. Note that the power switch does not turn off the standby power. Disconnect the power cord to turn off standby power.

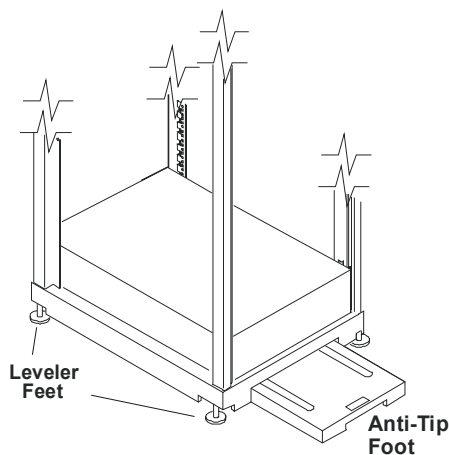
**NOTE**

If the backlight of the LCD is on, standby power is also on.

1. Extend the anti-tip foot from under the front of the rack.

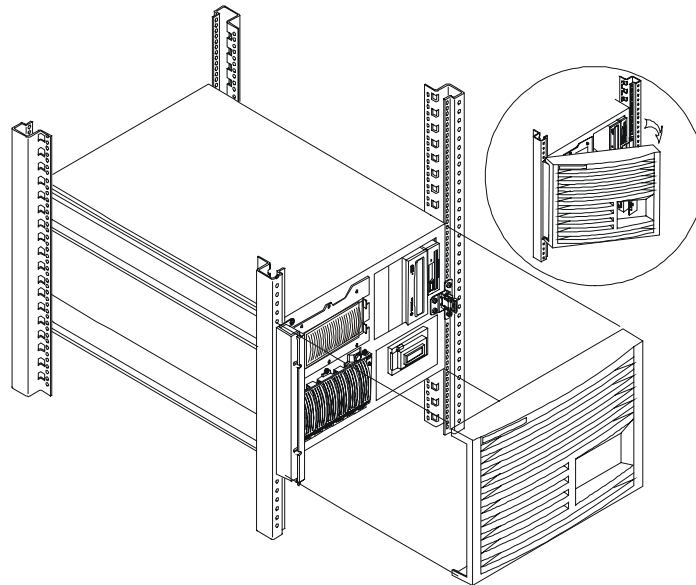
**WARNING**

This anti-tip device must be extended to prevent the rack and NetServer from tipping over, which could damage the NetServer and injure people.



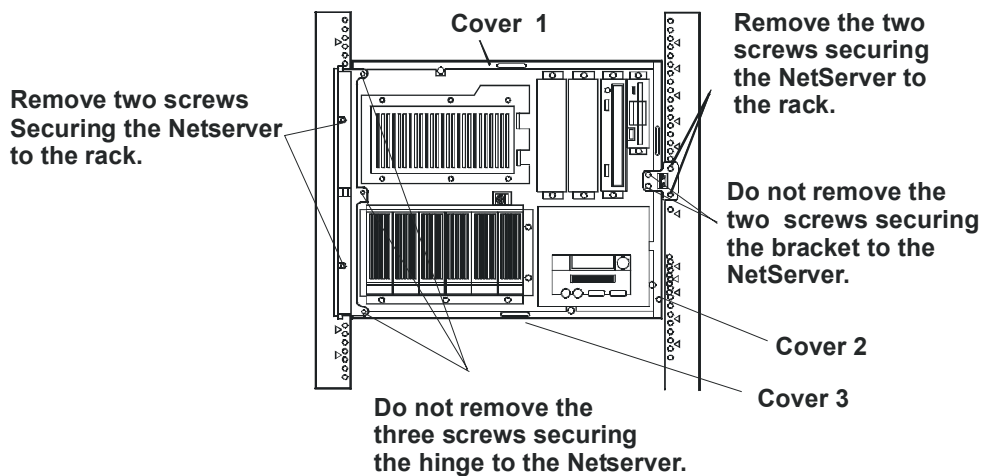
**Rack Anti-tip Foot**

2. Remove the bezel from the front of the NetServer by swinging the bezel open (past 90 degrees) until it releases from the three posts on the bezel hinge.

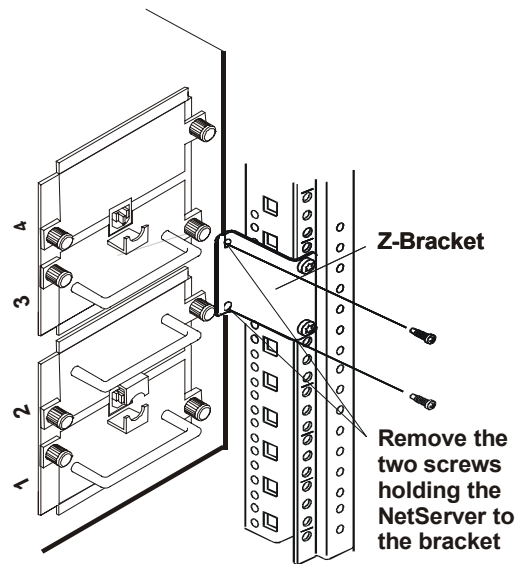


### Removing the HP NetServer LH 3000r Bezel

3. Use a Torx 15 screwdriver to unscrew the four screws.
4. Do not unscrew the entire hinge or bracket from the HP NetServer. Remove only the outer screws so the hinge and the bracket remain attached to the NetServer chassis.

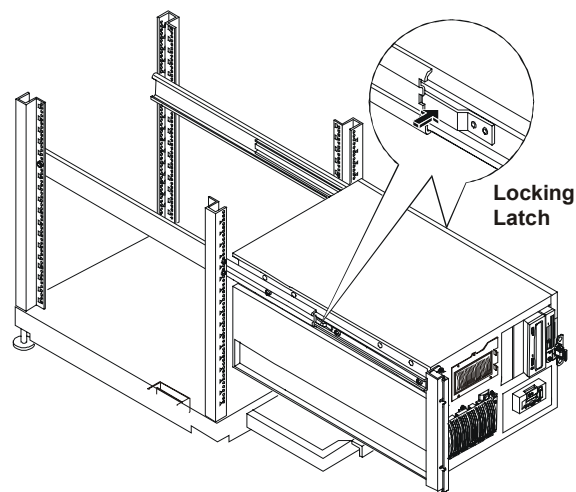


Front of LH 3000r Screw and Cover Locations



#### Remove Z-bracket

5. The z-bracket is used only during shipment to secure the NetServer to the rack. To remove the z-bracket, remove the two screws that connect the z-bracket to the column at the rear of the NetServer. Save the z-bracket for future use.
6. At the front of the NetServer, pull the NetServer forward from the rack until you hear the lockout device engage with a click.

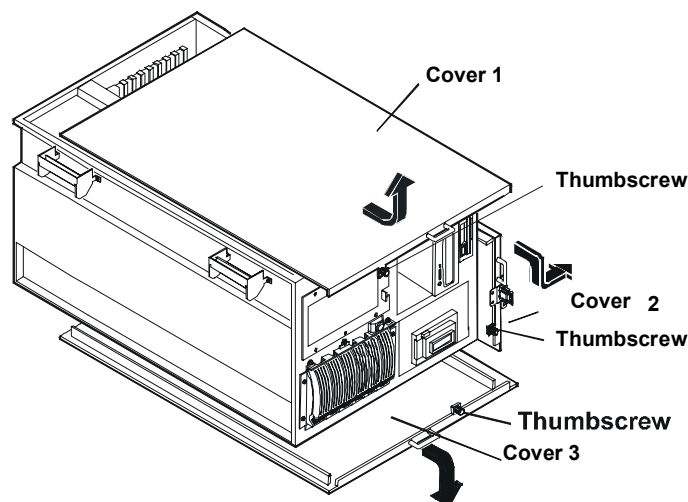


#### Locking Latch

#### CAUTION

The HP NetServer covers are heavy. Support them as you remove them, and allow room to move them away from the HP NetServer and for storage.

7. Remove Cover 1 by loosening the thumbscrew and sliding the cover forward to disengage it. Lift it up and away from the chassis.



#### HP NetServer LH 3000r Covers

8. Remove Cover 2 by supporting it with your hand, then loosening the thumbscrew and pulling the cover forward to disengage it. Lift it away from the chassis.
9. Remove Cover 3 by supporting it with your hand, and loosening the thumbscrew with the other hand. Pull the cover forward to disengage it and catch it as it falls away from the chassis.

## Removing the System Board Assembly

1. Log off all users and gracefully shut down the network operating system according to directions in your NOS documentation.
2. Power down the HP NetServer.
3. Disconnect the power cord and signal cables, and if necessary, label each one to support re-assembly.

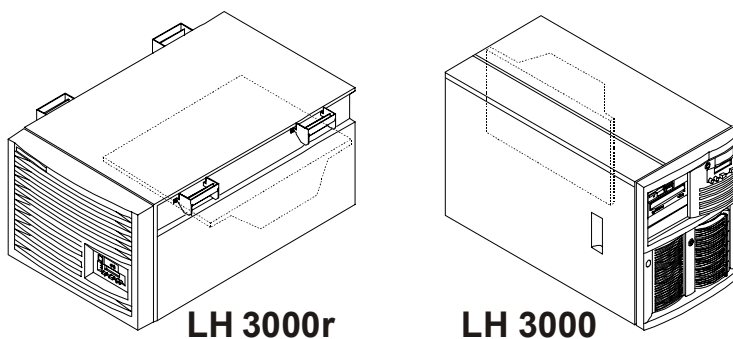
### CAUTION

The power supplies will continue to provide standby current to the NetServer until the power cable is disconnected.

4. Remove the covers to open the server.

### NOTE

HP recommends that you remove the system board assembly to install components.



Location of System Board Assembly

**WARNING**

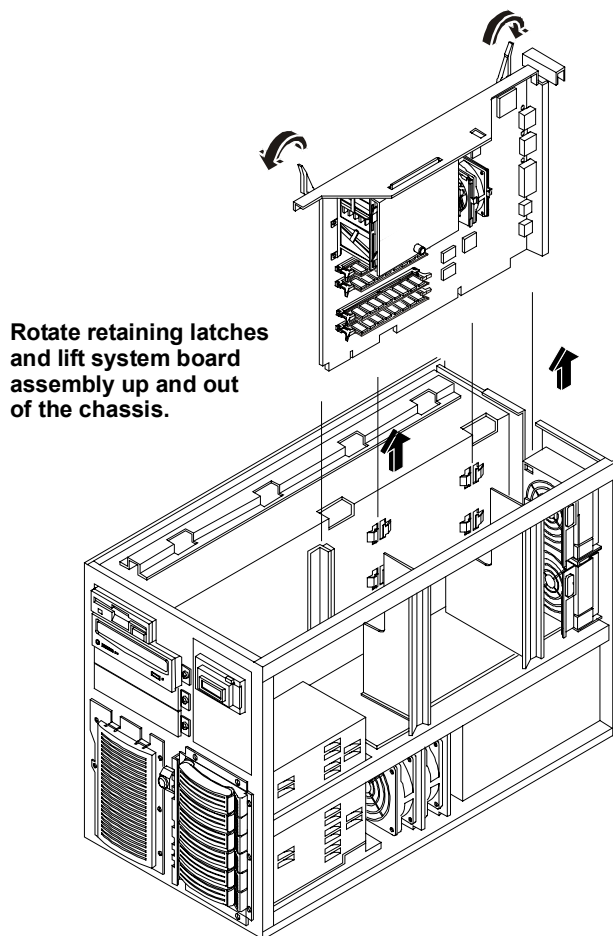
Always disconnect the power cord before removing the covers, to avoid exposure to high energy levels that may cause burns when parts are short-circuited by metal objects such as tools or jewelry. Disconnect any telephone cables to avoid exposure to shock hazard from telephone ringing voltages.

5. Unlatch the blue retaining latches to release the board.

**CAUTION**

The system board assembly weighs approximately 15 lbs. Have someone help you. One person can do it, but it is easier with two.

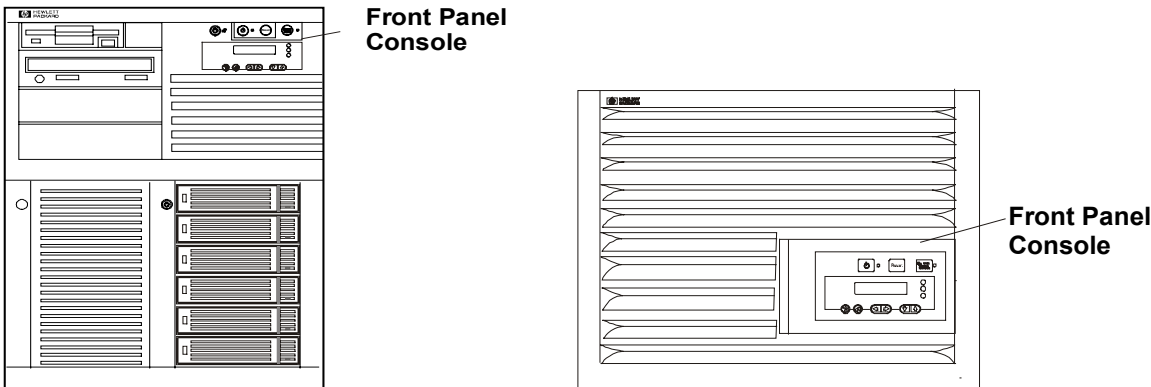
6. Pull the board out until it clears the chassis.

**Removing the System Board Assembly**

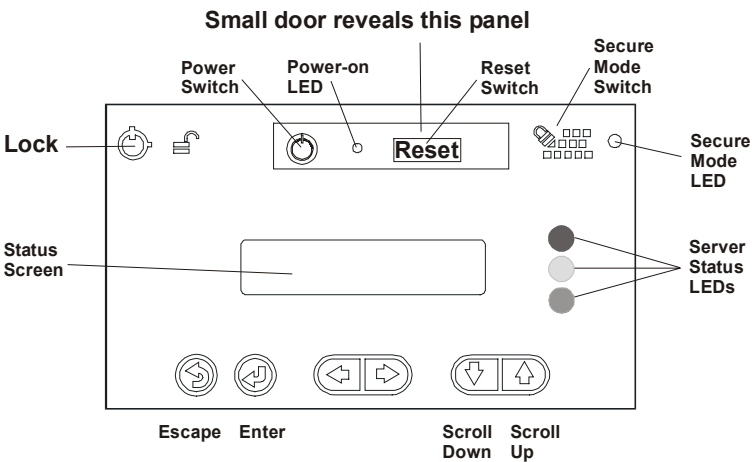
7. Slide the system board assembly from the chassis and place it metal plate side down on an anti-static pad. Install the desired component, either **DIMMs** or **processors**.

Controls and Indicators

Front Panel

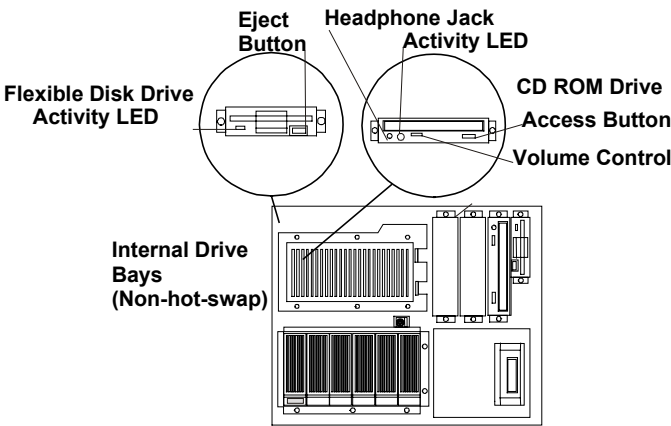


LH300r and LH300 Front View



Front Panel

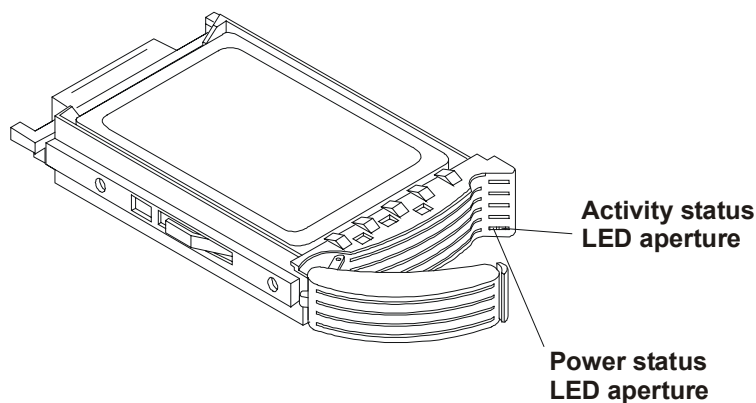
Other Front Indicators and Controls



CD-ROM, FDD, and HDD LEDs

## Hard Disk Drive LED Indicators

Each hot-swap hard disk drive module has two LED apertures on its front, one for power status and one for activity status. Light pipes on the module transmit light to these apertures from LEDs on the inside rear of the hot-swap mass storage cage.

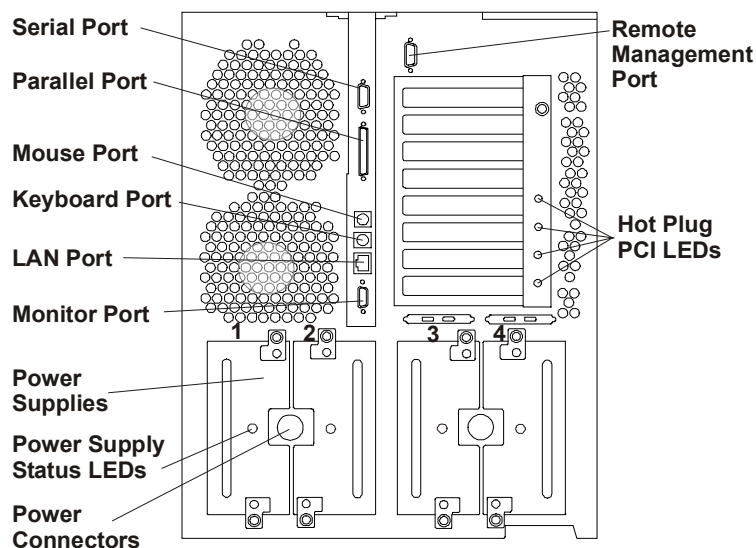


LED Apertures on Hot-Swap Hard Disk Drive Module

**NOTE** The Activity LED for a drive flashes green when the drive is accessed.

Status LED	Condition
Red Fast Flashing	Drive Fault
Amber Normal Flashing	Drive Failure Predicted
Green Solid	Drive Present and Normal
Red Solid	12V Fault

## Rear Panel

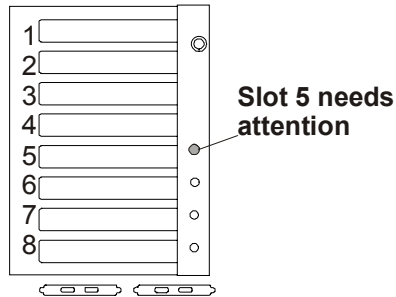


Rear Panel of the HP NetServer

The optional Redundancy Kit provides a third power supply. Since the HP NetServer requires two power supplies to run, a third power supply helps to prevent service interruptions. With the Redundancy Kit installed, a power supply can be hot-swapped.

## LEDs at the Rear of the Chassis

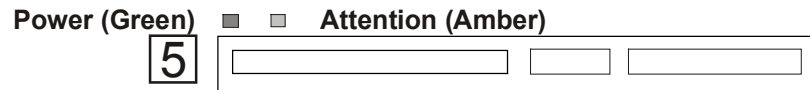
**PCI Attention LEDs** - If a hot plug board needs attention, its LED glows amber.



**Amber Attention LED**

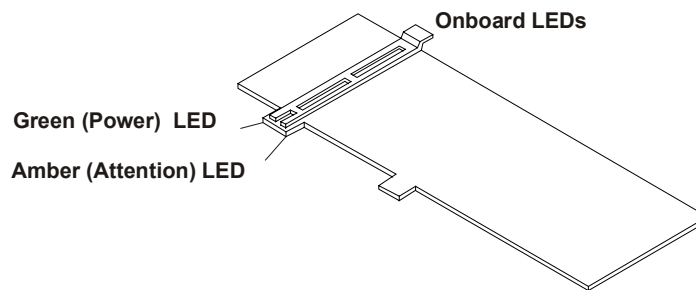
## PCI Power LEDs

Four pairs of very small LEDs are on the I/O board above left of each hot plug PCI slot. .



**Onboard LEDs**





The light from the small onboard LEDs is visible through the light pipes on the plastic slot separators.



**Light Pipes Display PCI LEDs**



**PCI Hot Plug LEDs**

Amber	Green	Status Indicated	Your Action
Off	 On	Power to the slot is on, and the slot is operating normally.	Do not remove the board from the slot.
	 On	The slot needs attention, but power to the slot is on.	Do not remove the board from the slot.
	Off	The slot needs attention, but power to the slot is off.	You can safely remove the board from this slot.
Off	Off	Power to the slot is off.	You can safely remove the board from this slot.

**Power Supply LEDs**

Green LED	Indicates this NetServer Status:
Steady Green	The system is powered up.
Flashing	The system is in stand-by or power-save mode.
Off	The AC line is unplugged or the power supply has failed.

**LAN LEDs**

The LH 3000 has two LEDs on either side of the RJ-45 connection. Interpret the LEDs in this way:

**Local Area Network LED Status**

Green LED	Yellow LED	LAN Status:
On/Flashing	Off	The LAN is connected and data is being transferred at 10Mbps.
On/Flashing	On	The LAN is connected and data is being transferred at 100Mbps.
Off	Off	The LAN is not connected or is not operational.

**Main Menu**

This is the status screen default display for the LH 3000:

```
HP NetServer
LH 3000
```

1. To reach the main menu from this default screen, press the **Enter** button.

**NOTE**

The status screen displays two lines of an entire menu at a time.

This is the entire Main Menu:

```
***Main Menu***
```

```
>Event Log
>FW Info
>System Info
>Component Info
>Service
>Adjust Contrast
```







Menus beginning with a greater-than symbol (>) indicate sub-menu selections.

2. Use the arrow buttons to move the cursor to your selection and press the Enter button.  
A cursor highlights the currently selected line.
3. To return to the Main Menu from one of these selections, press **Escape**.
4. To exit the Main Menu, press **Escape**.

## Viewing System Information

Use the HP NetServer's status screen and buttons to view system configuration information, a log of current and past conditions, replaceable parts information, adjust screen contrast, and more.

### Front Panel Console Buttons

Button Name	Description
 Escape	Return to a previous menu
 Enter	Select an item from a menu.
 Down Arrow	Scroll down one line through the current screen or menu.
 Up Arrow	Scroll up one line through the current screen or menu.
 Left Arrow	Adjust contrast (when adjust contrast menu selected)
 Right Arrow	Adjust contrast (when adjust contrast menu selected)

#### NOTE

The buttons and menus operate when the HP NetServer has powered down or hung, as long as the NetServer is plugged in. During POST (power-on self-test) the buttons and menus are disabled temporarily so that the status screen can display POST and boot messages.

## 2 System Information

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### Boot Drive Priority

The on-board SCSI controller has two channels, A and B. Channel A is typically used to control the Hot Swap SCSI drives. Channel B is typically used to control the internal non-hot swap SCSI drives. On each SCSI channel, the NetServer scans for a boot device starting at device ID 0 and proceeds up from there. The HP NetServer's boot order (BIOS search order for a boot device) should be considered, when connecting cables from the on board SCSI channels. A SCSI drive's boot priority is set by the drive's location in the boot order.

You can change this boot order using the Setup Utility (BIOS) and the SCSI Configuration Utility during the boot process. By default the NetServer searches for boot devices in this order:

1. IDE CD-ROM drive
2. Flexible disk drive
3. SCSI A bus (typically Hot Swap Mass Storage Cage)
4. SCSI B bus (typically non-Hot Swap internal SCSI devices)
5. PCI Slot P1
6. PCI Slot P2
7. PCI slot P3
8. PCI slot P4
9. PCI slot P5
10. PCI slot P6
11. PCI slot P7
12. PCI slot P8

### IRQ Settings

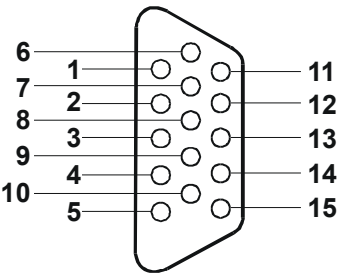
The BIOS automatically assigns the IRQs (hardware interrupts) for each PCI slot and embedded device in the HP NetServer during boot. These assignments trigger the NOS to enable the APIC (Advanced Programmable Interrupt Controller). APIC takes advantage of the expanded set of non-conflicting IRQs for those accessory boards requiring more than one IRQ per slot. APIC provides up to four dedicated interrupts for each PCI slot.

These automatic IRQ assignments can be changed in the setup screen (F2).

### Connector Pinouts

#### Video Connector Pinouts

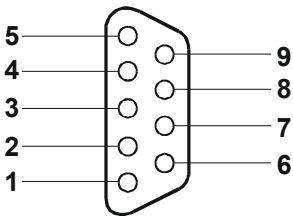
The built-in video uses the standard 15-pin analog display pinout configuration. The pinouts for your monitor may vary. For the pinouts for your monitor, refer to the manual that came with your monitor.



Video Connector Pinouts

Pin Number	Function	Pin Number	Function
1	Red	9	Key (no pin)
2	Green	10	Sync return (ground)
3	Blue	11	Monitor ID bit 0
4	Monitor ID bit 2	12	Monitor ID bit 1
5	Monitor self test (ground)	13	Horizontal sync (+)
6	Red return (ground)	14	Vertical sync (-)
7	Green return (ground)	15	Not used
8	Blue return (ground)		

Serial Port Connector

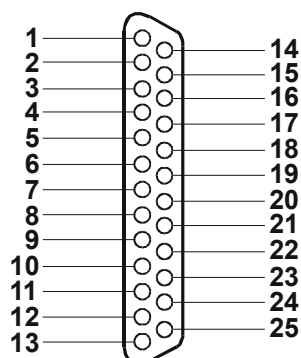


Serial Port Connector Pinouts

Serial Port Connector Pinouts

Pin Number	Signal Description
1	Data carrier detect
2	Receive data
3	Transmit data
4	Data term ready
5	Signal ground
6	Data set ready
7	Request to send
8	Clear to send
9	Ring indicator

## Parallel Port Connector



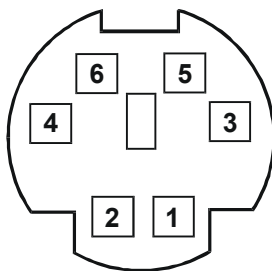
Parallel Connector Pinouts

Pin Number	Signal Description	Pin Number	Signal Description
1	Strobe <sup>5</sup>	10	Acknowledge <sup>b</sup>
2	Data bit 0 <sup>6</sup>	11	Busy
3	Data bit 1 <sup>a</sup>	12	Paper end
4	Data bit 2 <sup>a</sup>	13	Select
5	Data bit 3 <sup>a</sup>	14	Auto line feed <sup>b</sup>
6	Data bit 4 <sup>a</sup>	15	Error <sup>1</sup>
7	Data bit 5 <sup>a</sup>	16	Initialize printer <sup>b</sup>
8	Data bit 6 <sup>a</sup>	17	Select in <sup>b</sup>
9	Data bit 7 <sup>a</sup>	18-25	Signal ground

a. All data bits are sent to a printer in an 8-bit parallel format.

b. The signal is active low.

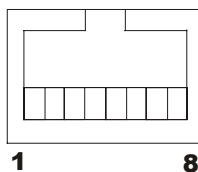
## Mini-DIN Connectors



Mini-DIN Connector Pinouts for the Mouse and Keyboard

Pin Number	Signal Description
1	Data signal
2	Not used
3	Ground
4	Power (+5 V dc)
5	Clock signal
6	Not used

## LAN Connector



LAN Connector

LAN Connector Pinouts

Pin Number	Signal Description
1	Data signal
2	Not used
3	Ground
4	Power (+5 V dc)
5	Clock signal
6	Not used

## Memory Guidelines

The standard LH 3000/3000r configuration ships with one 128 MB DIMM in socket 0.

- Add DIMMs of these sizes:
  - ◊ 128 MB
  - ◊ 256 MB
  - ◊ 512 MB
  - ◊ 1 GB
- Add memory in any order to the four sockets.
- You can mix DIMM sizes. For example, you may place a 1 GB DIMM next to a 128 Mb DIMM.
- Maximum configuration is 4 GB.
- Do not rock the DIMM into place, but apply firm and even pressure until it is seated in the socket.
- Use only HP-supported DIMMs.

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**NOTE**

If non-HP DIMMs are used, the NetServer will report this during boot.

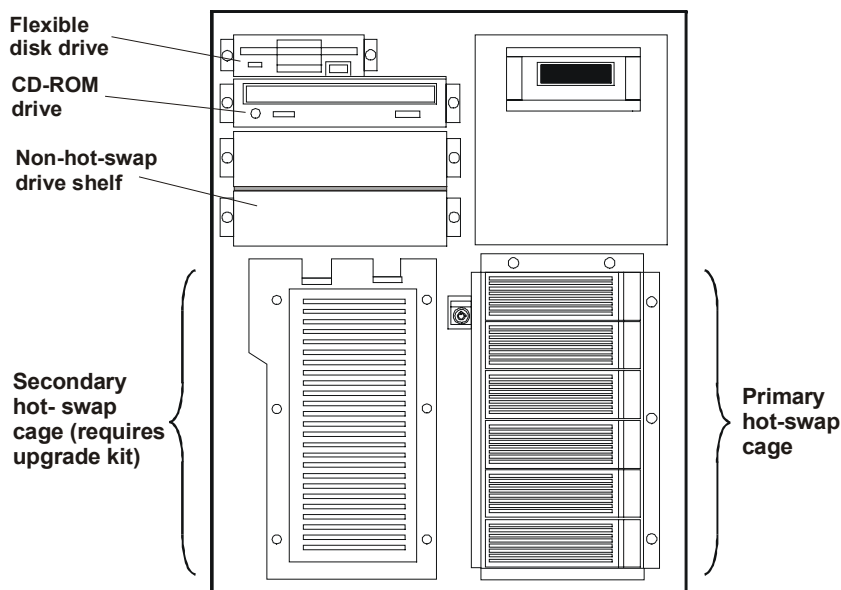
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## Mass Storage Guidelines

The HP NetServer standard configuration is:

- One hot-swap mass storage cage (primary)
  - ◊ Configured with a single SCSI bus
  - ◊ Installed with requested drives

- ◊ With filler panels in the slots not occupied by drives
- An enclosure for a second hot-swap mass storage cage (secondary)
- A flexible disk drive
- A CD-ROM 32x drive
- Non-hot-swap mass storage shelves



## Accessory Board Guidelines

The I/O board is under Cover 1 on the **top** of the LH 3000r and under the **left** cover of the LH 3000.

- Use the respective NOS software utility to
  - ◊ Ensure the correct software drivers for the PCI board are loaded
  - ◊ Verify correct operation
  - ◊ Shut down power to hot plug slots

### CAUTION

Do not attempt to install or remove non-hot plug PCI boards with the HP NetServer in any kind of sleep state, or a system crash or hang may occur. See Sleep States.

- Slots 1, 2, 3, and 4 are non-hot plug slots 5, 6, 7, and 8 are hot plug.
- For optimal performance, add PCI boards to slots 4, 5, and 6, which at 33MHz and 64 bit, and on the primary bus, are the fastest.
- Consider the boot priority prior to installing accessory boards, but after configuring the HP NetServer.
- Some accessory board outputs may exceed U.S. National Electrical code (NFPA 70) Class 2 or power source limits and must use appropriate interconnecting cabling in accordance with the National Electrical Code. (All Hewlett Packard boards comply with Class 2.)
- You can configure the NetServer to boot from a PCI-based DAC inserted into a PCI slot. Use the Symbios Configuration Utility to select a different PCI slot when scanning for boot devices.

- Slots 7 and 8 accept universal boards. Universal boards automatically switch to accept power from a +5.0 or +3.3 VDC.

## Hot Addition and Replacement of Hot Plug PCI Boards

The PCI Hot Plug option is NOS-dependent. To use the Hot Plug option, the PCI board must have a hot plug compliant driver and a Hot Plug Utility for the respective NOS. The Hot Plug Utility is used to turn power off/on to the PCI slot, while the HP NetServer continues to operate normally.

### NOTE

Hot Removal or online deletion of an adapter board and reconfiguring of that adapter from the NetServer is not supported.

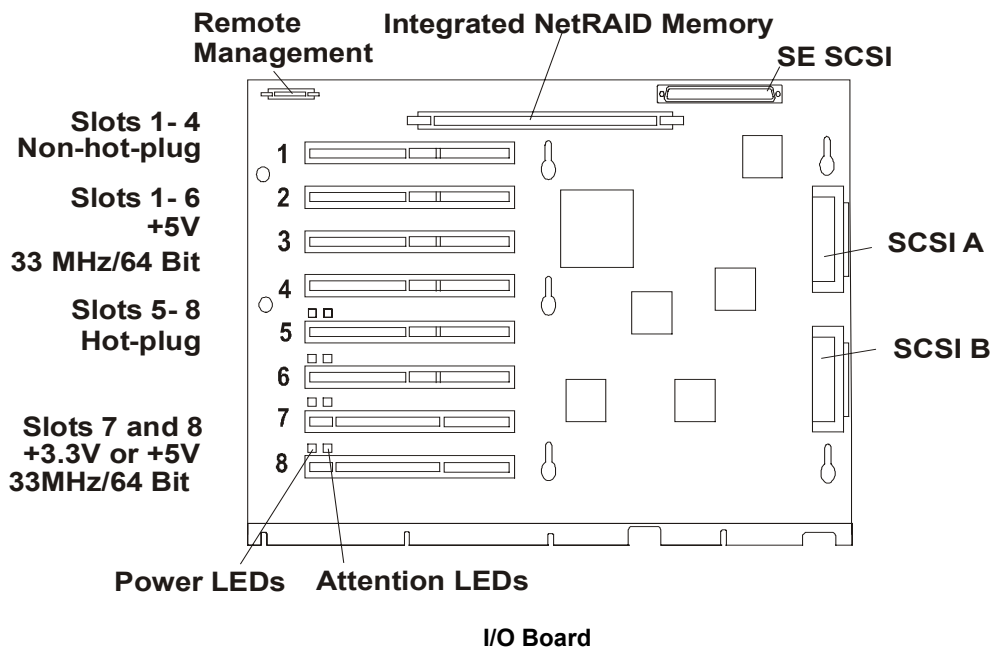
## Additional Information

For more current PCI Hot Plug information and PCI Hot Plug drivers, go to:

<http://www.hp.com/cposupport/>

Select your product and download the latest software. PCI hot plug drivers are in the SCSI section.

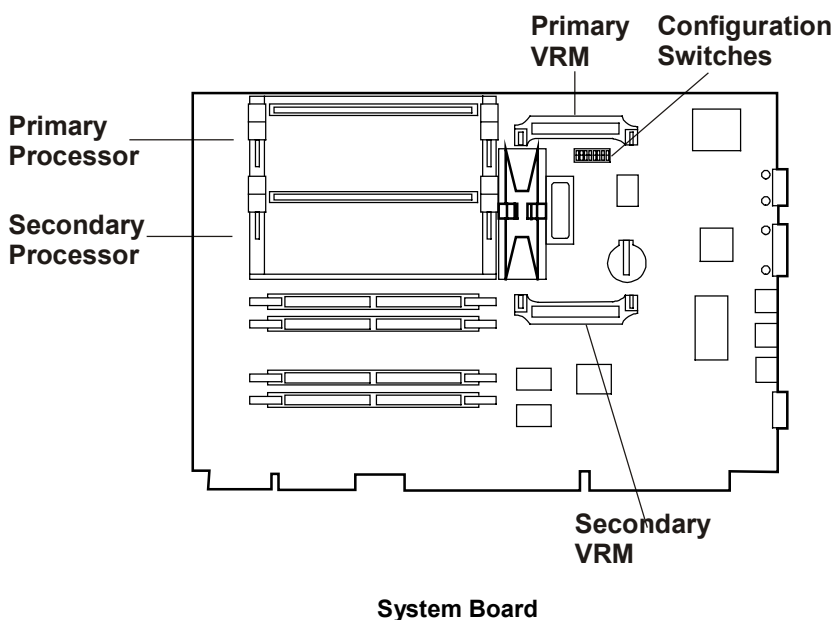
## I/O Board



## Processor Guidelines

The HP NetServer LH 3000/3000r supports two processors in primary and secondary slots. The NetServer ships with one processor and an accompanying VRM in the primary slots. The processor and VRM are on the system board.



**CAUTION**

Do not remove the processor from its bag until you are ready to install it. Make sure the bag remains sealed. Before you remove a processor from the anti-static container, touch a grounded, unpainted metal surface on the HP NetServer to discharge static electricity.

Do not change the processor speed switches as this can result in unreliable or intermittent performance, and data integrity may also be at risk.

- Use only processor upgrade kits with the same HP product number. This ensures the processor type, clock speed, and cache size match, and processor stepping are compatible.
- Be sure that the VRM and the processor module associated with it are both in either the primary or the secondary pair of slots.

## Technical Specifications

The specifications listed below vary if a mass storage device is installed that has more stringent environmental limits. Make sure that the operating environment for the server is suitable for all the mass storage devices being used.

### Thermal

<b>Operating</b>	5° to 35° C (41° to 95° F)
<b>Non-operating</b>	-40° to +65° C (-40° to +149° F)

### Humidity

<b>Operating</b>	20% to 80% relative humidity, non-condensing
<b>Non-operating</b>	5% to 95% relative humidity, non-condensing

**Altitude**

<b>Operating</b>	-30 to 3,045 m (~ 10,000 ft)
<b>Non-operating</b>	-30 to 12,180 m (~ 40,000 ft)

**Acoustic Emissions**

Sound level (LpA): 58<dBA

**Physical Requirements****Minimum Clearance**

	<b>HP NetServer LH 3000r</b>	<b>HP NetServer LH 3000</b>
<b>Front</b>	1 m (39 inches)	1 m (39 inches)
<b>Sides</b>	2.5 cm (1 inch)	2.5 cm (1 inch)
<b>Top</b>	2.5 cm (1 inch)	2.5 cm (1 inch)
<b>Back</b>	15 cm (6 inches)	15 cm (6 inches)

**Weight and Dimensions**

**NOTE** Use one person for every 40 pounds of NetServer weight when lifting it.

	<b>LH 3000r</b>	<b>LH 3000</b>
<b>Height</b>	354.7 mm (14 in)	494.8 mm (19.5 in)
<b>Width</b>	482.6 mm (19 in)	350.5 mm (13.8 in)
<b>Depth</b>	749.2 mm (29.5 in)	724.2 mm (28.5 in)
<b>Weight Empty</b>	35 - 50 kg (77 - 110 lbs.)	35 - 50 kg (77 - 110 lbs.)

**Power Requirements**

<b>Power supply type</b>	<b>Auto-Ranging</b>
Input voltages:	100 to 127 VAC ~ 8.3 A at 50Hz
Nominal:	200 to 240 VAC ~ 3.9 A at 60 Hz
Range:	90 to 132 VAC at 47 - 63 Hz 180 to 264 VAC at 47 - 63 Hz
Power availability:	550 W continuous

**Input Power Ratings**

Voltage (VAC)	Current (A)rms	Volt-Amps (VA)	Watts (W)
100	8.3	833	825
120	6.8	815	806
208	3.8	792	777
230/240	3.4	790	774

**Video**

The video memory used for the HP 3000 or HP 3000r NetServer is a 16Mbit (2MB) SGRAM, with architecture of 256K x 32 bit x 2 banks.

**2D Video Modes**

The LH 3000 supports these 2D video configurations:

Resolution	Rate @ 256 Colors	Rate @ 65K Colors	Rate @ 16.7M Colors	Rate @ True Color
640 x 480	60, 72, 75, 85, 90, 100, 120, 160, or 200 Hz	60, 72, 75, 85, 90, 100, 120, 160, or 200 Hz	60, 72, 75, 85, 90, 100, 120, 160, or 200 Hz	60, 72, 75, 85, 90, 100, 120, 160, or 200 Hz
800 x 600	47, 56, 60, 70, 72, 75, 85, 90, 100, 120, 160, or 200 Hz	47, 56, 60, 70, 72, 75, 85, 90, 100, 120, 160, or 200 Hz	47, 56, 60, 70, 72, 75, 85, 90, 100, or 120 Hz	47, 56, 60, 70, 72, 75, 85, 90, 100, or 120 Hz
1024 x 768	43, 60, 70, 72, 75, 85, 90, 100, 120, 140, or 150 Hz	43, 60, 70, 72, 75, 85, 90, 100, 120, 140, or 150 Hz	not supported	not supported
1152 x 864	60, 70, 75, 80, 85, 100, or 120 Hz	43, 47, 60, 70, 75, 80, 85, 100, or 120 Hz	not supported	not supported
1280 x 1024	43, 47, 60, 70, 74, 75, 85, 90, or 100 Hz	not supported	not supported	not supported
1600 x 1200	52, 58, 60, 66, 70, 75, or 76 Hz	not supported	not supported	not supported

**3D Video Modes**

At 2 MB of SGRAM, the LH 3000 supports these video resolution configurations.

Resolution	Color Depths
512 x 384	16 bits
640 x 480	16 bits

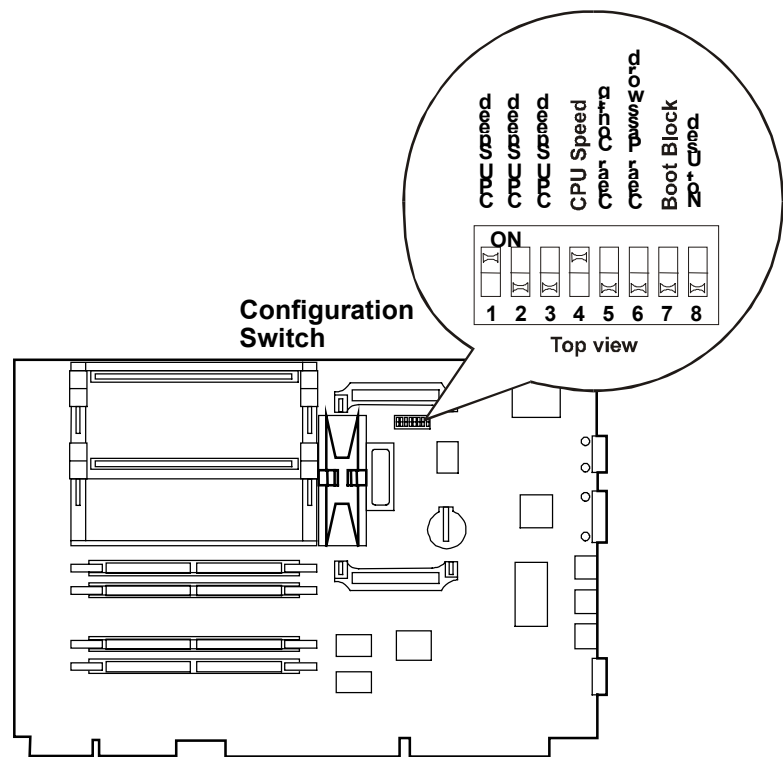
**NOTE**

The 65K color is equivalent to 16 bits, true color is 32 bits. Final resolution for the display depends upon capabilities of the embedded video and the monitor. Check the specifications supplied by the monitor manufacturer for refresh rates at the various resolutions.

# Switch Settings

**CAUTION**

Processor modules are designed to operate at their stated speed, for example, 533 MHz. Do not set the configuration switches to a different speed. Setting the processor speed to another speed may result in unreliable or intermittent performance. Data integrity may also be placed at risk if processors are operated at speeds other than that specified on the processor module.



Configuration Switch and Settings

Configuration Switches – CPU Speed

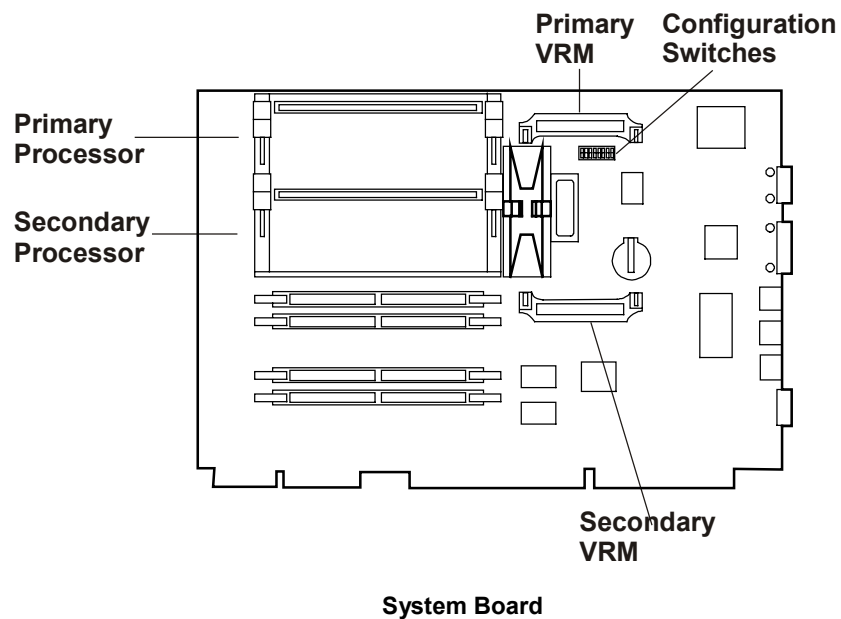
Speed	Switch 1	Switch 2	Switch 3	Switch 4
266 MHz	ON	ON	ON	ON
333 MHz	ON	ON	ON	OFF
400 MHz	ON	ON	OFF	ON
466 MHz	ON	ON	OFF	OFF
533 MHz	ON	OFF	ON	ON
600 MHz	ON	OFF	ON	OFF
666 MHz	ON	OFF	OFF	ON
733 MHz	ON	OFF	OFF	OFF

**Note:** all processor speeds are currently supported

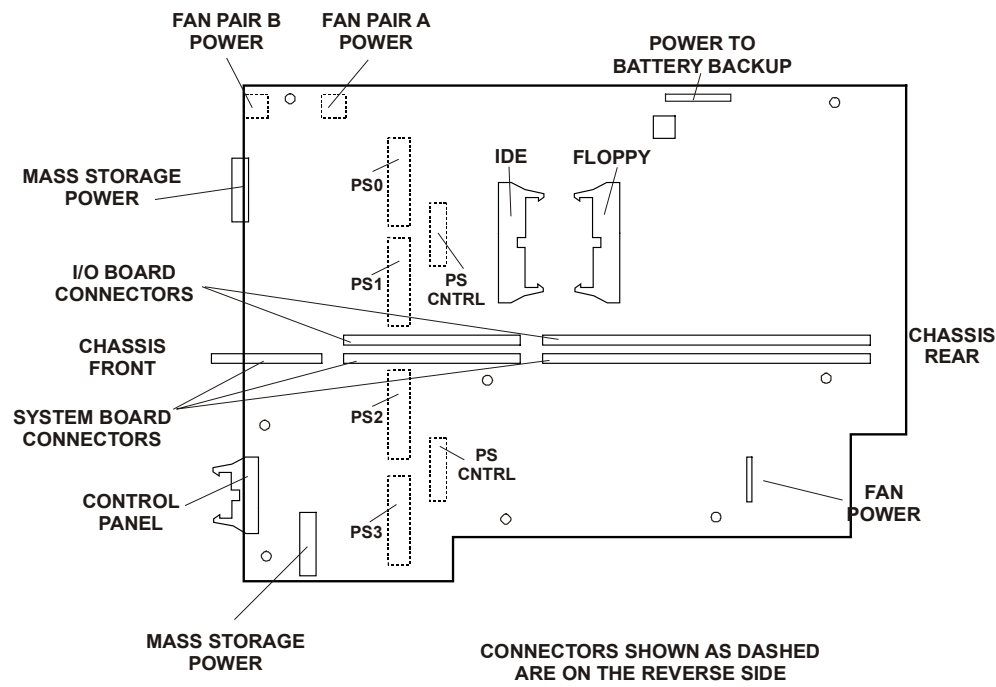
**Configuration Switches S5-S8**

Switch	Function	To Enable
Switch 5	Clear Configuration	ON (normally OFF)
Switch 6	Clear Password	ON (normally OFF)
Switch 7	Boot Block	ON (normally OFF)
Switch 8	Not Used	N/A

Use this topic to determine the switch settings of the configuration switch block located on the system board.

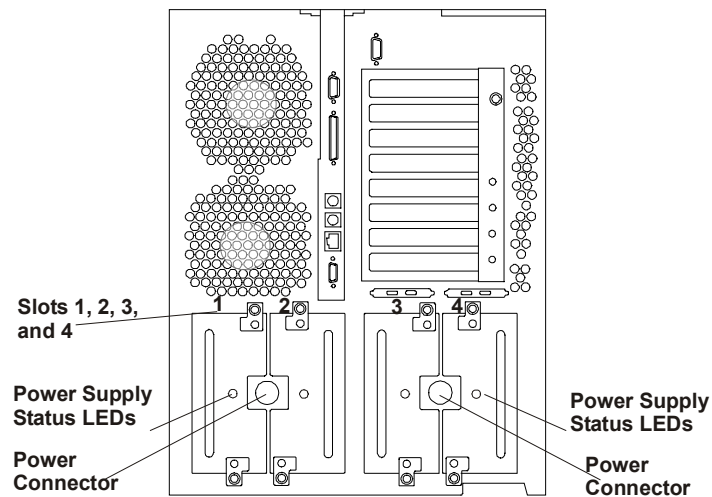
**System Board**

# Power Management/Interconnect Board Illustration



## Power Supplies

You can install the third power supply in slot three or four.



**Rear View of LH 3000/LH 3000r**

If you have an un-interruptible power supply (UPS), refer to the instructions supplied with it.

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**NOTE**

If you have installed your HP NetServer LH 3000r into a rack, refer to the *Rack Cabling Reference for the HP NetServer LH 3000/ LH 3000r* for instructions on how to cable the NetServer to external connections.

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The HP NetServer performs a diagnostic test when it is connected to an external power source, and then performs another test when the power switch is turned on. If an error condition occurs, note any error code appearing on the front panel and check it in the Error Code listing.

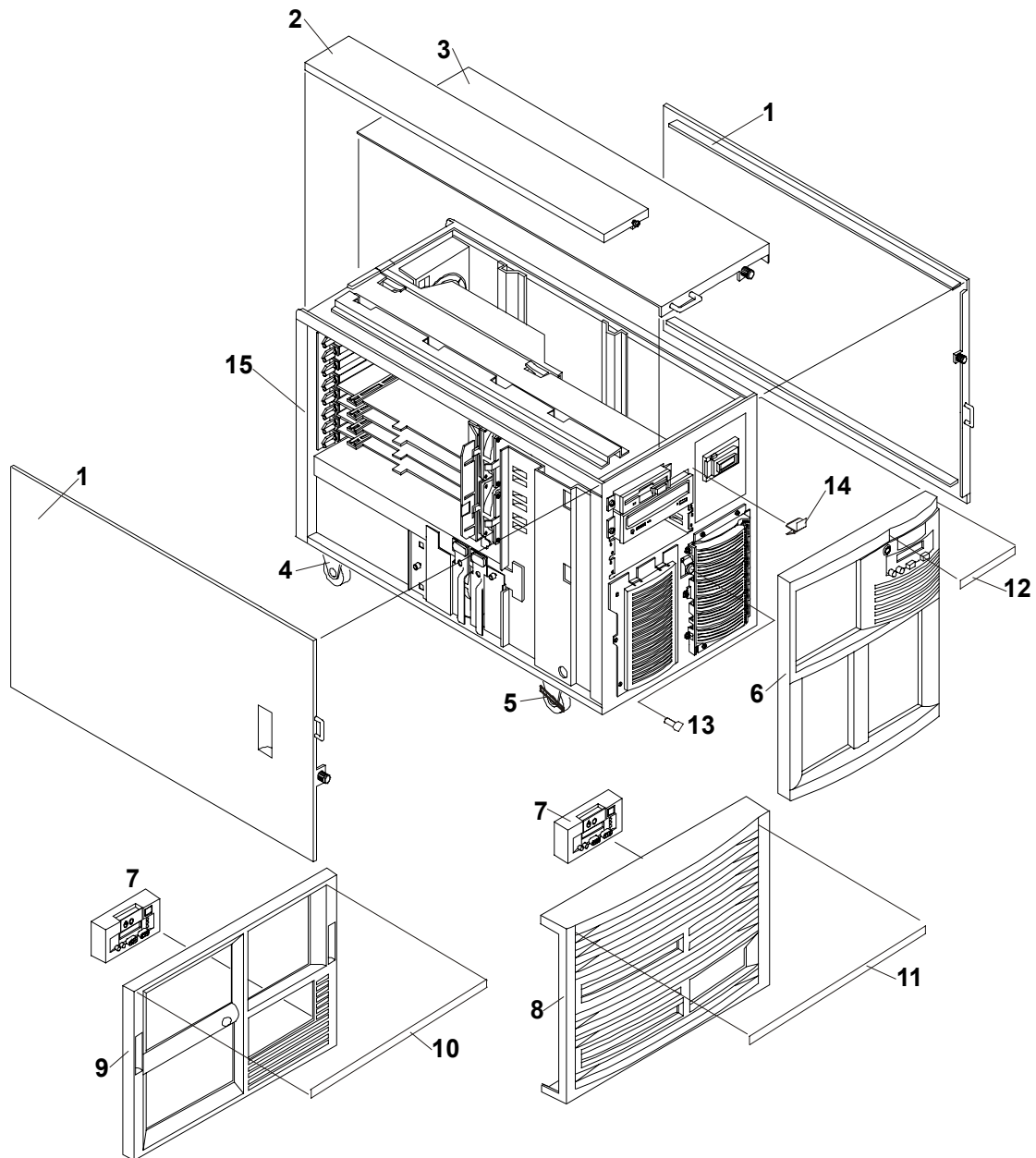




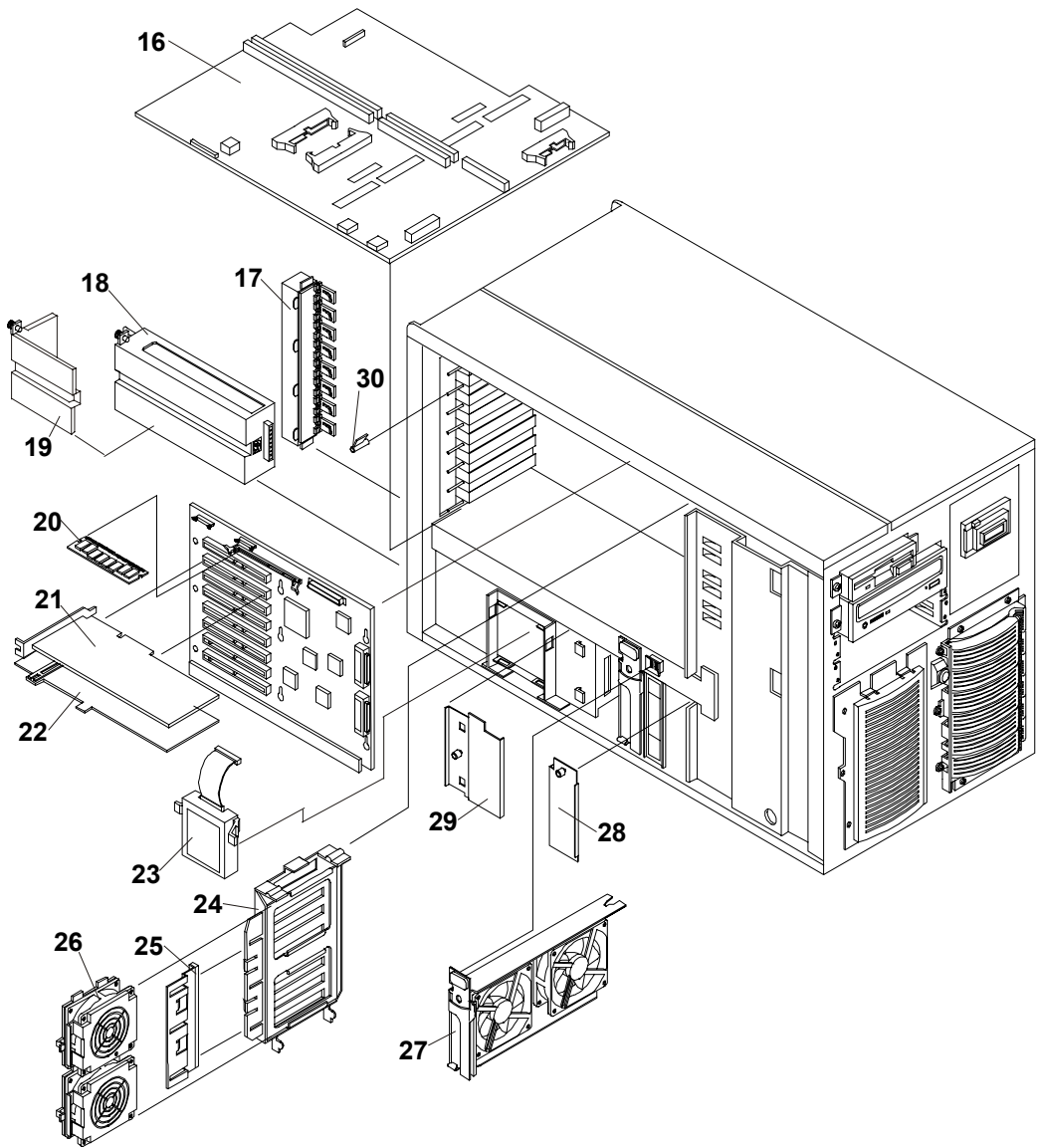
### 3 Parts Information

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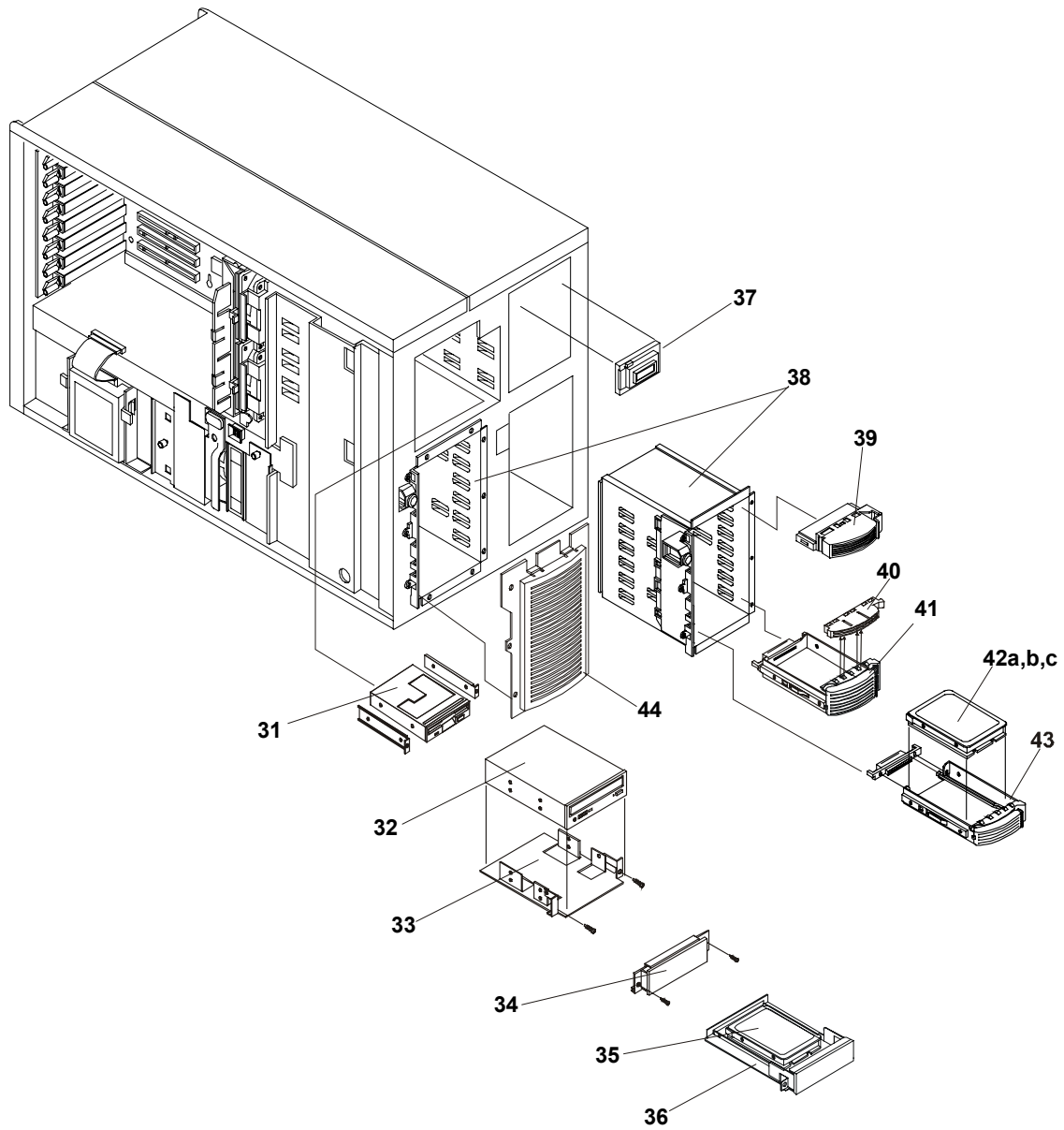
#### Exploded View - Covers and Bezels



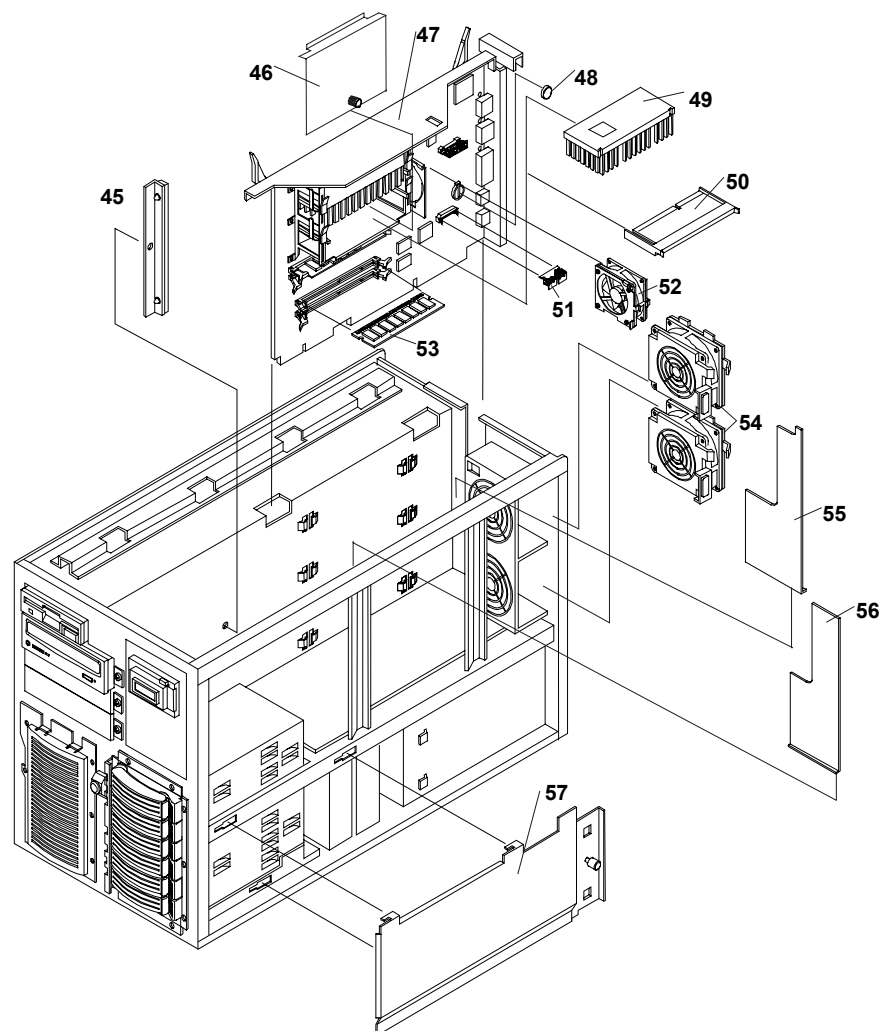
# Exploded View - I/O Board, Power Supply, Fans



## Exploded View - Mass Storage



# Exploded View - System Board Assembly



## Replaceable Parts List

The items in this list and the corresponding item numbers in the respective Exploded Views apply to both models of the HP NetServer, except where noted.

### NOTE

The part numbers listed below were available at the time of publication. Part numbers may change after publication. Order parts by the number listed below; HP's parts price list database will generally contain a reference to the revised part number. If a system board or I/O needs to be replaced, remove processor modules or adapter boards and transfer these to the new board. Ensure all jumper and switch settings on the old board are transferred to the new board.

Fig	Description	Replacement	Exchange
1	Side panels (top and bottom in rack version)	5064-4694	
2	Top cover - I/O board side	5064-7906	
3	Top cover - system board side	5064-7910	
4	Rear castors	1490-1007	
5	Front castors	5182-9416	
6	Pedestal bezel – w/lock	D8228-63019	
7	Control panel -bezel (for rack versions only)	5064-4639	
8	HP rack bezel – w/lock	D8228-63018	
9	Non-HP rack bezel – w/lock	D8228-63029	
10	System Nameplate - Non-HP rack	D8228-63011	
11	System Nameplate - HP rack	D8228-63012	
12	System Nameplate - pedestal	D8228-63010	
13	System key	5182-4534	
14	Bezel latch	D8228-63023	
15	Chassis	Not orderable	
16	Power Management/Interconnect board	D8228-63006	D8228-69006
17	PCI Hot-Plug Assy. (includes: shell, PCA, card retainers, latches, and cables)	D8228-63024	
18	Power supply	0950-2816	
19	Power supply cover	5002-6989	
20a	I/O channel memory, 32 MB	D8228-63020	
20b	I/O channel memory, 64 MB	D7155-63000	
20c	I/O channel memory, 128 MB	D7156-63000	
21	Accessory PCI card - example	N/A	
22	PCI slot divider	Not orderable	
23	NetRAID battery backup module plus cable - Option	D8550-63001	
24	PCI card guide/ I/O fan support	Not orderable	
25	Card retainer	Not orderable	
	I/O Board	D8228-63001	D8228-69001

Fig	Description	Replacement	Exchange
26	I/O fan	D8228-63013	
27	Power supply fans w/frame	D8228-63015	
28	Forward I/O side air baffle	Not orderable	
29	Rear I/O side air baffle	Not orderable	
30	PCI latch (part of item 17)	N/A	
31	1.44 MB floppy disk drive	5064-6554	
32	CD ROM drive	D4384-60002	
33	CD ROM/Tape drive mounting trays (2-pack, no front panel)**	D2199A**	
34	Drive bay cover	5063-8389	
35	3.5 inch, 9.1 GB Ultra-Wide SCSI drive (7200 rpm) for common tray only**	D4911A**	
36	3.5 inch hard drive mounting trays (3 pack non-hot swap)**	D2198B**	
37	Control panel	D8228-63017	
38	Hot-swap drive cage	D8520-63003	D8520-69003
39	Hot-swap filler panel	5064-4689	
40	Hot swap-spacer	Not orderable	
41	Half-height, hot-swap disk tray**	D6127A**	
42a	3.5 inch, 9.1 GB low-profile, hot-swap Ultra2 drive (7200 rpm) **	D6106A**	
42b	3.5 inch, 9.1 GB low-profile, hot-swap, Ultra2 drive (10000 rpm)**	D6107A**	
42c	3.5 inch, 18.2 GB low-profile, hot-swap, Ultra2 drive (7200 rpm)**	D6108A**	
43	Low-profile, hot-swap disk tray**	D6128A**	
44	Hot-swap bay cover	Not stocked	
45	Card guide for upgrade	Not orderable	
46	System board cage cover	Not orderable	
47	System board	D8228-63000	D8228-693000
48	System battery	D8520-63012	
49a	PIII/533 Processor	D8509-63002	D8509-69000
49b	PIII/600 Processor	D8510-63003	D8510-69000
49c	PIII/667 Processor	D8511-63004	D8511-69000
49d	PIII/700 Processor	D851x-xxxx	D851x-xxxx
49e	PIII/733 Processor	D9184-63000	D9184-69000
50	Terminator board	D8228-63009	
51	Voltage Regulator Module	D8520-63010	
52	Processor (CPU) fan	D8228-63016	
53a	DIMM 64MB SDRAM	D8264-63000	D8264-69000

Fig	Description	Replacement	Exchange
53b	DIMM 128MB SDRAM	D8265-63001	D8265-69001
53c	DIMM 256MB SDRAM	D8266-63001	D8266-69001
53d	DIMM 512MB SDRAM	D8267-63001	D8267-69001
53e	DIMM 1GBMB SDRAM	D8268-63001	D8268-69001
53f	DIMM Terminator	D8520-63024	
54	System board (Exhaust) fans	D8228-63014	
55	Air guide, rear	Not orderable	
56	Air guide, front	Not orderable	
57	System board side air baffle	5002-6995	
58*	Control panel cable (ribbon)	D8228-63030	
59*	Hot swap bay power harness	D8228-63031	
60*	Auxiliary hot swap bay (left)/ non-hot swap power harness	5183-3449	
61*	Management port cable (ribbon)	5183-2143	
62*	IDE signal cable (ribbon)	5183-3442	
63*	Floppy disk drive cable (ribbon)	5183-3443	
64*	Internal SCSI (ribbon)	5183-3444	
65*	Mouse	C3751-60201	
66	Duplex SCSI Board	D8280-63000	

\* This part is not on an exploded view.

\*\*May be ordered as an accessory.





## 4 Diagnostics

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### Diagnostics

Two types of diagnostics support the LH 3000:

- **Boot Diagnostics**  
These are routines that are executed automatically when the LH 3000 is booted on, and before loading of the Network Operating System (NOS) begins.
- **DiagTools**  
This is a functional test suite that comes with the LH 3000 and other HP NetServers.

### Boot Diagnostics

Boot diagnostics include a number of types of tests:

- **Built-in Self-Tests**  
These are tests that execute within specific components such as the processors or controllers (for example, the front panel controller).
- **Power-On Self-Test**  
This is a set of test routines executed by the boot processor. Faults detected in this testing are reported as POST error codes. These codes will appear on the display monitor and the front panel LCD while POST executes. These messages will also be recorded in the System Event Log (SEL) which is accessible through the front panel LCD display and Event Log Reporting Utility (Navigator CD-ROM). The POST routines can display an error message on the video display screen, the speaker beeps twice as the message appears.
- **Initialization and Configuration Routines**  
Before the network operating system (NOS) is loaded, the system will move applicable pieces of firmware into main memory (for example the PCI Video BIOS or the SCSI BIOS) and initialize peripheral channels (for example the SCSI channels). If the display reports a particular procedure is underway and the system simply stops, you may infer that the displayed procedure has crashed the system. For example, if the boot process stops while the SCSI firmware is loading and initializing the SCSI channels, then there may be problems with the SCSI cables or components. Use the Setup utility or the SCSI Configuration utility to make any changes to the configuration. If you cannot correct an error, refer to **General System Problems**.
- **Beep codes occur when errors cannot be viewed on the screen.** Typically these signal fatal test errors that occur before the video BIOS is loaded and messages can appear on the display. These errors may generate a message to the System Event Log (SEL) which may be accessed through the front panel LCD display or the Event Log Reporting Utility.

### Minimum Requirements for Boot Diagnostics

As a minimum, in order to start running boot diagnostics the NetServer must find a working processor with which to boot, and data path to the ROM BIOS which supplies the bootstrap firmware. The system soon needs space in main memory into which firmware will be moved to support NOS operations after booting.

### HP NetServer DiagTools

The purpose of hardware diagnostic software is to provide tools for checking for serious hardware problems. By design, diagnostic software executes simple tests of each hardware component in turn. Usually, such

tests create assurance that hardware is not the source of system problems. This allows the user to eliminate hardware as the cause of the problem and to focus on operating system configuration parameters, network connections, and application software configuration parameters as the source of the problem.

If hardware problems are confirmed, the diagnostic software program can sometimes detect and diagnose the subsystem or specific system component that is the cause of the problem. In addition, diagnostic tools can capture information that allows support personnel to quickly assess the condition of system.

In order to be effective, diagnostic software tools must be used in the context of a wider troubleshooting procedure.

## DiagTools Capabilities

DiagTools for HP NetServers is a set of off-line diagnostic tests, including tests for system and processor components, memory and storage elements, ports, and input/output devices. DiagTools is supplied on the HP NetServer Navigator with HP NetServer series LC, LH, LP and LX. The user prepares DiagTools software for use by transferring it to diskette. Then the DiagTools diskette is used to boot the server. A basic suite of tools checks key NetServer components, and a menu of advanced tests is available for in-depth testing.

DiagTools has the capability to test the following components:

- system board
- memory modules
- flexible disk drives
- serial ports
- video monitor
- processors
- hard disk drives
- keyboards
- parallel ports
- CD-ROM drives

DiagTools is an off-line diagnostic test series. Off-line diagnostics do not use the main operating system (OS) of the HP NetServer. The alternate DiagTools OS has far fewer features than the full-fledged OS. Thus, its capabilities are limited to a set of basic tests and a series of advanced tests. In addition, DiagTools does not use any tests that might write over and thus destroy user data. Tests that require user inputs or decisions are left to the advanced series of tests.

You can use DiagTools to support troubleshooting to carry out the tasks listed below:

- display a high-level inventory of the system under test
- save and print a detailed inventory of hardware components
- conduct a basic test of components listed in the system inventory
- display “PASSED” or “FAILED” overall results of basic tests
- record detailed test results of basic system tests
- display a menu of advanced tests
- select and run one or a series of advanced tests
- add the record of results of advanced tests to the record of basic tests
- view a list to locate the meaning of a specific error code
- view one or more steps to help confirm and isolate error conditions
- browse the Support Ticket, which contains the detailed inventories and test results
- add comments to the Support Ticket

If you have TopTools remote management software installed and configured for use with DiagTools, you can accomplish any of the above lists of tasks remotely.

## Advantages and Limitations of Hardware Diagnostics

Off-line diagnostic software is useful in making sure that has been eliminated as the cause for possible system problems. Such diagnostic tools can easily be shipped with a server, and they are relatively easy to use.

However, off-line diagnostic software should be used only by experienced personnel who can take a wider view of its limitations, which include:

- booting the server from the diagnostics diskette
- no access to operating system error logs, since the OS is not operating at the same time as the diagnostic tools
- limited ability to test only a single component at a time
- inability to indicate problems with wrongly configured systems or the network

## Event Log Display Utility

This utility shows events logged in the System Event Log (SEL) and provides advisory information. Brief descriptions of the events are also available through the front panel LCD display. To access this utility, boot the system with the Navigator CD-ROM in the CD-ROM drive. When the Navigator Main Menu comes up, select "NetServer Utilities", then "More NetServer Utilities," and then "Event Log Report Utility."

Be patient. The utility may take a while to read the event log from non-volatile memory.

The Event Log Display Utility is also available through DiagTools.

## POST Routines

The POSTS executed during startup are:

Test	Description
<b>Processor Test</b>	Tests the processor's registers. Test failure causes an error message to be displayed and the boot process to abort.
<b>System (BIOS) ROM Test</b>	BIOS ROM chip calculates an eight-bit checksum. Test failure causes an error code to be displayed and the boot process to abort.
<b>Memory Subsystem Test</b>	Tests the physical configuration of the memory subsystem. The test checks for valid memory module combinations. Test failure causes an error code to be displayed.
<b>RAM Refresh Timer Test</b>	Tests the RAM refresh timer circuitry. Test failure causes an error message to be displayed and the boot process to abort.
<b>Interrupt RAM Test</b>	This test checks the first 64 K of system RAM used to store data corresponding to various system interrupt vector addresses. Test failures cause an error message to be displayed and the boot process to abort.
<b>CMOS RAM Test</b>	Checks the CMOS RAM for start-up power loss, verifies CMOS RAM checksum. Test failure causes error codes to be displayed.
<b>Cache Memory Test</b>	Tests the processor's internal cache RAM. Test failure causes an error message to be displayed and the boot process to abort.
<b>Keyboard/Mouse Controller Test</b>	Checks for proper operation of the Keyboard/Mouse Controller. Test failure causes an error code to be displayed.
<b>Timer 0/Timer 2 Test</b>	Tests Timer 0 and Timer 2. Test failure causes an error code to be displayed.
<b>DMA Sub-system Test</b>	Checks the DMA controller registers. Test failure causes an error code to be displayed.

Test	Description
<b>Interrupt Controller Test</b>	Tests the interrupt masks. Test failure at any point causes an error code to be displayed.
<b>RAM Address Line Independence Test</b>	Verifies the address independence of real-mode RAM (that address lines are not stuck together). Test failure causes an error code to be displayed.
<b>Real-Mode Memory Test (First 640 K)</b>	Read/write test on system real-mode RAM. The test checks each block of system RAM to determine how much is present and displays the current base value upon successful completion of the test. Test failure of a 64 K block of memory causes an error code to be displayed and the remainder of the memory test to be skipped.
<b>Shadow RAM Test</b>	Tests Shadow RAM in 64-Kbyte segments, except for the segments beginning at A000h, B000h, and F000h. If they are not being used, segments C000h, D000h, and E000h are tested. Test failure causes an error code to be displayed.
<b>Real-Time Clock Test</b>	Checks the real-time clock registers and performs a test that ensures the clock is running. Test failure causes an error code to be displayed.
<b>Keyboard Test</b>	Invokes built-in keyboard self-test of keyboard's microprocessor and tests for stuck keyboard keys. Test failure causes an error code to be displayed.
<b>Mouse Test</b>	Invokes built-in mouse self-test of mouse's microprocessor and tests for stuck mouse buttons. Test failure causes an error code to be displayed.
<b>Flexible Disk Controller Subsystem Test</b>	Tests for proper operation of the flexible disk controller. Test aborts after the first or is found and will not test any further. Test failure causes an error code to be displayed.
<b>Internal Numeric Coprocessor Test</b>	Checks for proper operation of the numeric coprocessor part of the processor. Test failure causes an error message to be displayed and the boot process to abort.
<b>Serial Port Test</b>	Tests the two embedded serial port registers. Test failure causes an error code to be displayed.
<b>Parallel Port Test</b>	Tests the one embedded parallel port, if it is enabled. Test failure causes an error code and an error message to be displayed.
<b>Hard Disk Subsystem Test</b>	Tests for proper operation of the hard disk controller and performs a read-verify of a sector on the disk. Test aborts after the first error is found and will not test any further. Test failure causes an error code to be displayed.
<b>System Configuration Tests</b>	Checks for configuration errors and checksums accessory ROMs. Test failure causes an error code to be displayed.

## Beep Codes

If the POST routines cannot display messages when an error occurs before the video display is initialized, the server emits a series of beeps. This means that if on boot you get a blank screen, but hear beeps, you should refer to the table below to interpret the beeps.

### Beep Codes for Fatal Errors

P = Check and replace processor board  
 S = Check and replace system board  
 M = Check and replace memory modules  
 R = Replace ROM chip

Beep Code	Test Failure	I/O port 80H	Repair
1-3-1-1	Test DRAM refresh	20	S, P
1-3-1-3	Test 8742 Keyboard Controller	22	S, P
1-3-3-1	Test DRAM	28	M
1-3-4-1	Test 64K base address lines	2C	M, P
1-3-4-3	Test 64K base memory	2E	M, P
1-4-1-1	Test 64K base memory (upper 16 bits)	30	M, P
2-1-2-3	Copyright checksum	46	R

If you still don't see anything and:

1. If you press **F1** and nothing happens, confirm the following:
    - ♦ The keyboard cable is properly connected to the keyboard and the keyboard port.
    - ♦ The keyboard is not locked, and network server mode is not enabled. (If either the keyboard lock or network server mode was enabled in the Setup utility, type in the password.)
  2. If the server beeps several times and does not display an error message, the server has experienced a fatal POST error. If this happens, refer to the for instructions and precautions, turn off the system, unplug the power cord, and do the following:
    - ♦ Remove and reinsert the all NetServer PCBs and accessory boards firmly in their slots.
    - ♦ Remove and reinsert the CPU(s) and VRM(s) firmly in their sockets in the system board.
- ♦ Remove and reinsert the memory modules firmly and correctly in their sockets.

## Error Messages

To decode a POST error message that appears during boot, simply re-boot with the Navigator CD-ROM in the CD-ROM drive. The Error Message Utility will interpret the POST failure and suggest a remedy. The Power-On Self-Test (POST) diagnostics will display an error message if an error condition is encountered during the boot process. These codes and their descriptions are listed here. These codes will appear on the display monitor, provided it, and the supporting circuitry, is functioning:

### NOTE

Do not take remove/replacement actions until you have taken other troubleshooting steps. See the **Troubleshooting Checklist**.

#### 0000 The power-on self-test has detected a failure limited to the system board internal functions.

Skipping the error message and continuing may result in unstable behavior, or a system hang during the boot process.

In case of further errors, your system board may need to be replaced. Contact your service representative.

#### 0011 When the HP NetServer remains unplugged for a long period of time, the battery that provides the current to keep the system date and time may become discharged.

1. Check that the battery is properly inserted.
2. If necessary, replace the battery.
3. Set time and date from the Setup utility or from your operating system.

#### 0012 The HP NetServer configuration has been cleared or has not been initialized. Run the Setup utility to re-

configure your system.

**0020 The ROM on the accessory board is either bad, or the board is conflicting with a system board reserved resource (address, DMA or IRQ).**

**0070 The Smart Interrupt Router FPGA failed to initialize. This problem prevents your system from booting and operating. If the error persists, replace the system board.**

**0071 The data for the Smart Interrupt Router FPGA is corrupted. This problem prevents your system from booting and operating. If the error persists, try re-flashing the system BIOS before replacing the system board. See the recovery boot procedure.**

**0075 The firmware for the Integrated HP NetRAID is not responding. This problem prevents the operation of the Integrated HP NetRAID.**

To correct this problem, flash the Integrated HP NetRAID firmware and reboot the system.

If the error persists, replace the I/O board.

**0080 The HP NetServer Management Controller failed its self-test.**

Due to this failure remote access and server management event logging are not available.

- To correct this problem reset the Management Controller by powering off the HP NetServer and disconnecting the power cord for 20 seconds. Reconnect the power cord and power on the HP NetServer.
- OR,
- Update the system BIOS by running the flash utility from the HP Navigator CD-ROM. To do this, insert the HP Navigator CD-ROM in the CD-ROM drive and power-cycle your system.

If the error persists, your system board may need to be replaced. Contact your service representative.

**0090 The DIMM Management Controller has failed to respond.**

This does NOT affect the performance or functionality of the memory. However, due to this failure DIMM management features are not available.

To correct this problem reset the Management Controller by powering off the HP NetServer and disconnecting the power cord for 20 seconds. Reconnect the power cord and power on the HP NetServer.

If the error persists, your system board may need to be replaced.

**0100 A key on the keyboard has been pressed during the HP NetServer power-on self-test.**

1. Ensure that nothing was put on the keyboard during boot process, and that a key was not accidentally pressed down.
2. If the error persists, your keyboard may need to be replaced. Contact your service representative.

**0101 The keyboard has reported an error during its self-test.**

1. Restart your HP NetServer.
2. If the error persists, your keyboard may need to be replaced. Contact your service representative.

**0102 The system board self-test has detected a general failure on the integrated keyboard controller.**

Your system board may need to be replaced. Contact your service representative.

**0103 The keyboard is not connected.**

1. Check that the keyboard connector is firmly connected.
2. If the problem persists, your keyboard cable may be damaged or your keyboard may need to be replaced. Contact your service representative.

**0105 The mouse has reported an error during its self-test.**

1. Clean the mouse and its moving ball as described in the User's Guide.
2. If the problem persists, your mouse may need to be replaced. Contact your service representative.

**0106 The mouse is not responding.**

1. If the mouse has just been removed, press **[F4]** to automatically validate the change.
2. Otherwise, check that the mouse connector is firmly connected.
3. If the problem persists, your mouse may need to be replaced. Contact your service representative.

**0300 The flexible disk drive A has reported an error during its self-test.**

1. Check if a diskette can be properly inserted and removed from the flexible disk drive.
2. Check that the flexible drive type configured in the Setup utility matches the flexible disk drive installed in the HP NetServer.
3. Check that all data cables and power cables are firmly connected.
4. If the problem persists, your flexible disk drive may need to be replaced. Contact your service representative.

**0306 The system board self-test has detected a general failure on the integrated flexible disk controller.**

Your system board may need to be replaced. Contact your service representative.

**0310 The flexible disk drive A is not responding, but is configured in the Setup utility.**

1. If the flexible disk drive A has just been removed, press **[F4]** to automatically validate the change.
2. Otherwise, check that all data cables and power cables are firmly connected.
3. If the problem persists, your flexible disk drive may need to be replaced. Contact your service representative.

**0400 The CD-ROM drive has reported an error during its self-test.**

1. If a CD-ROM disk is present, check that it is correctly inserted.
2. Check that CD-ROM drive door or tray has not been opened or closed during the self-test.
3. Check that all data cables and power cables are firmly connected.

4. If the problem persists, your CD-ROM drive may need to be replaced. Contact your service representative.

**0401 The CD-ROM drive is not responding but is configured in the Setup utility.**

1. If the CD-ROM drive has just been removed, press **[F4]** to automatically validate the change.
2. Check that all data cables and power cables are firmly connected.
3. If the cable is damaged, connect the hard disk drive to another IDE cable, if available.
4. If the problem persists, your CD-ROM drive may need to be replaced. Contact your service representative.

**0500 The system board self-test has detected a general failure on the integrated hard disk controller.**

Your system board may need to be replaced. Contact your service representative.

**052X The specified hard disk drive is not responding but is configured in the Setup utility.**

1. If the specified hard disk has just been removed, press **[F4]** to automatically validate the change.
2. Check that all data cables and power cables are firmly connected.
3. If the cable is damaged, connect the hard disk drive to another IDE cable, if available.
4. If the problem persists, your hard disk drive may need to be replaced. Contact your service representative.

Error codes #0520, #0521, #0522, #0523 respectively apply to HDD0, HDD1, HDD2, and HDD3 as described in the Setup utility.

**0076 The processor for the Integrated HP NetRAID is not responding.**

This problem will prevent the operation of the Integrated HP NetRAID, if it is enabled. The problem may also prevent operation of some PCI slots.

To correct this problem:

Flash the integrated HP NetRAID firmware and reboot the system.

If the error persists, your I/O board may need to be replaced. Contact your service representative.

**0080 The NetServer Management Controller failed its self-test.**

Due to this failure remote access and server management event logging are not available.

To correct this problem:

Reset the management controller by powering off the NetServer and disconnecting the power cord for 20 seconds. Reconnect the power cord and power on the NetServer.

OR

Update the system BIOS by running the flash utility from the Navigator CD-ROM.

**0600 The video memory size detected during the power-on self-test is smaller than previously detected.**

1. If the video memory module has just been removed or replaced by a smaller one, press **[F4]** to automatically validate the change.



2. If the problem persists, your video memory module may need to be replaced. Contact your service representative.

**0700 The system memory size detected during the power-on self-test is smaller than previously detected. One or several main memory modules are either disconnected, or have been replaced by smaller ones.**

1. If some main memory modules have just been removed or replaced by smaller ones, press **[F4]** to automatically validate the change.
2. If no main memory module has been removed or changed, ensure all modules are properly inserted in their sockets.
3. If the problem persists, one of your main memory modules may need to be replaced. Contact your service representative.

**07XX One main memory module has reported an error during its self-test.**

(This error may cause serious problems to the HP NetServer operation.)

1. Isolate the defective memory module using the error code 07xy with x = bank number, y = module number. The memory module sockets are put in the following order: 071X=A, 072X=B, and 073X=C.
2. Remove the memory module from its socket and clean the edge connector.
3. Re-install the memory module.
4. If the problem persists put your memory module in another socket. If the error code changes and indicates the new location of the memory module, it needs to be replaced. Contact your service representative.
5. To allow the HP NetServer to start with the remaining available memory, remove the defective module and change the memory size in the Setup utility.

**0800 The cache memory size detected during the power-on self-test is smaller than previously detected. The cache memory module is either disconnected, defective or has been replaced by a smaller one.**

1. If the processor module has just been removed or replaced by a smaller one, press **[F4]** to automatically validate the change.
2. If the problem persists, the microprocessor may need to be replaced. Contact your service representative.

**0801 The cache memory module has reported an error during its self-test.**

1. Verify that your microprocessor is installed correctly. Refer to your User's Guide for handling precautions.
2. If the problem persists, your microprocessor may need to be replaced. Contact your service representative and specify the error code.

**0900 The system could not disable the integrated LAN.**

Please power down the NetServer and remove the AC power cord for 20 seconds. Replace the cord and restart the NetServer.

If the error appears upon restarting, update the system BIOS by running the flash utility from the Navigator CD-ROM. To do this, insert the Navigator CD-ROM into the CD-ROM drive and power-cycle the system.

If the error persists, one or more system boards may need to be replaced. Contact your service representative.

**0901 The system could not enable the integrated LAN.**

Please power down the NetServer and remove the AC power cord for 20 seconds. Replace the cord and restart the NetServer.

If the error appears upon restarting, update the system BIOS by running the flash utility from the Navigator CD-ROM. To do this, insert the Navigator CD-ROM into the CD-ROM drive and power-cycle the system.

If the error persists, one or more system boards may need to be replaced. Contact your service representative.

**0B0X Your system is missing the update data block for the Pentium III microprocessor.**

You must correct this problem in order to avoid possible malfunction or reliability problems.

To correct the problem, update your BIOS by running the flash utility from your HP Navigator CD-ROM. To do this, insert the HP Navigator CD-ROM in the CD-ROM drive and power-cycle your system.

If updating your BIOS does not clear this error, contact your service representative.

**0B1X Your system has failed to load the Microcode Update data block for the Pentium III microprocessor.**

You must correct this problem in order to avoid possible malfunction or reliability problems.

To correct the problem, update your BIOS by running the flash utility from your HP Navigator CD-ROM. To do this, insert the HP Navigator CD-ROM in the CD-ROM drive and power-cycle your system.

If updating your BIOS does not clear this error, contact your service representative.

**0B2X The Microcode Update data block for the Pentium III microprocessor is defective.**

You must correct this problem in order to avoid possible malfunction or reliability problems.

To correct the problem, update your BIOS by running the flash utility from your HP Navigator CD-ROM. To do this, insert the HP Navigator CD-ROM in the CD-ROM drive and power-cycle your system.

If updating your BIOS does not clear this error, contact your service representative.

**0B3X The microprocessors installed in your NetServer are not of the same type or speed.**

You must correct this problem in order to avoid possible malfunction or reliability problems.

To correct the problem:

You must ensure that all microprocessors in a multiprocessor configuration are of the same type and speed.

## 5 Troubleshooting

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### Preventive Maintenance Procedures

Refer to this table for preventive maintenance procedures for this HP NetServer. Be sure to turn off power to the NetServer when cleaning it.

Component	Time Frame	Maintenance Procedure
Keyboard	Regularly	Dust with damp, lint-free cloth.
Monitor screen	Regularly	Use "HP Video Screen Cleaning Solution" found in 92193M Master Clean Kit.
Mouse	Regularly	Refer to the mouse's manual for mouse maintenance procedures.
Tape drive heads	Monthly	Use "Magnetic Head Cleaning Solution" found in the 92193M Master Clean Kit.
Cooling fans and grilles	6 Months	Check functions of cooling fans and clean the intake openings on the chassis of dust, lint, and other obstructions to airflow.

<b>CAUTION</b>	DO NOT use petroleum-based cleaners (such as lighter fluid) or cleaners containing benzene, trichlorethylene, ammonia, dilute ammonia, or acetone. These chemicals could damage the keyboard's plastic surfaces.
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HP recommends the periodic cleaning of tape heads, capstans, and guides on HP drive units and those products using high-density data cartridges and mini-data cartridges. This maintenance procedure prolongs tape and head life and helps reduce read/write errors due to dust and oxide

### Troubleshooting Tips

<b>WARNING</b>	Before removing a cover, always disconnect the power cords and unplug telephone cables. Disconnect telephone cables to avoid exposure to shock hazard from telephone ringing voltages. Disconnect the power cords to avoid exposure to high energy levels that may cause burns when parts are short-circuited by metal objects such as tools or jewelry.
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<b>CAUTION</b>	<p>Do NOT operate the HP NetServer for more than 60 minutes with any cover (including power supplies and disk drives) removed. Otherwise, damage to system components may result due to improper cooling airflow.</p> <p>However, you can safely remove a cover while the HP NetServer is running to remove and replace PCI Hot Plug boards. For any other service activity requiring access to the processor board or I/O board, power down the HP NetServer and observe all safety precautions.</p>
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- For problems with the disk array controller board, refer to the appropriate HP NetRAID manuals.

- For problems with HP TopTools, refer to the *HP TopTools Administrator Guide* on the HP Web Site at:

<http://www.hp.com/toptools>

- For general information on management products, refer to:

[http://www.hp.com/go/netserver\\_mgmt](http://www.hp.com/go/netserver_mgmt)

and search for "management."

## General Troubleshooting Sequence

To troubleshoot an installation problem, perform the following checks in the order given:

- Unplug the power cords, wait 20 seconds, plug the power cords in again, and restart the HP NetServer. Check for normal operation.
- Check all cable and power connections, including those in the rack, etc.
- Ensure the HP NetServer is properly configured.

Most NetServer problems are the result of incorrect system and SCSI subsystem configurations.

◇ Check the Setup Utility, and the SCSI Configuration Utility.

◇ If the HP NetServer is configured with a disk array, check the Disk Array Utility.

- If the error is a network-related problem, determine if the server has enough memory and hard disk drive capacity. Consult your network operating system manual.
- Verify all cables and boards are securely plugged into their appropriate connectors or slots.
- If you suspect a hardware error, follow these steps:
  - a. Log users off the LAN and power down the server.
  - b. Extend the HP NetServer out of the rack and remove the cover.
  - c. Simplify the HP NetServer configuration to the minimum required:
    - \* Monitor
    - \* Keyboard
    - \* Mouse
    - \* 1 hard disk drive and 1 flexible disk drive
    - \* 1 CD-ROM
  - d. Remove all third-party options, and reinstall each one, one at a time, checking the HP NetServer after each installation.
  - e. Replace the cover and reconnect the power cords and other cables.
  - f. Start the HP NetServer and, if it does not function properly, refer to the following procedures.

## The System Will Not Power Up

1. Make sure that the power supply modules are properly seated.
2. Verify that power is available at the AC power receptacle – the green LEDs should be flashing when the power is off and the system is in standby.
3. Verify that the power source is within the specified range.
4. Verify that the AC power circuit breaker is closed.

## The System Will Not Boot

1. Inspect the memory board(s). Check that all DIMMs are seated properly.
2. Check that the DIMM configuration on the memory boards matches those allowed. A minimum of one DIMM must be installed.
3. Verify that the memory boards are fully seated. When the memory board is fully seated, the retaining latches are closed (they should be flush with the front of the memory board). With the NetServer powered off, pull out gently on the board to see if the board comes unseated. If it does, reseat the board fully by engaging the retaining latches and closing them fully.
4. Check the boot order with the SCSI configuration utility.
5. Make sure that the server is plugged into to the correct power source.
6. Check that the processors are installed in the correct sockets and that terminator boards are installed in all unused sockets.
7. If the system fails during boot, but without a video display, listen for beep codes to get an error message.
8. If the system fails during boot and presents a POST error code, use the POST error code listing or the Event Log Display to decode the error and get suggested remedies.
9. If the system fails during boot without a clear error message, consider attempting a BIOS recovery.

## Intermittent Failures

1. Make sure that the fan modules are fully seated.
2. Verify that the server is plugged into a power source that is within specification.
3. Make sure that the internal SCSI chain is terminated and that termination is not enabled on any of the drives. Note that with LVD SCSI, termination is provided in the cable.
4. Check that the processors are installed in the correct sockets and that terminator boards are installed in all unused sockets.
5. Reseat the main memory DIMMs and I/O DIMMs.

## Clearing the System Configuration

You may need to clear the system configuration if a program has corrupted the configuration, or if incorrect settings made in the Setup utility have made the display unreadable.

To clear the system configuration, the procedure is the same for the rack-mount and the pedestal HP NetServers once you gain access to the system board assembly.

1. Log off all users and gracefully shut down the network operating system according to directions in your NOS documentation.

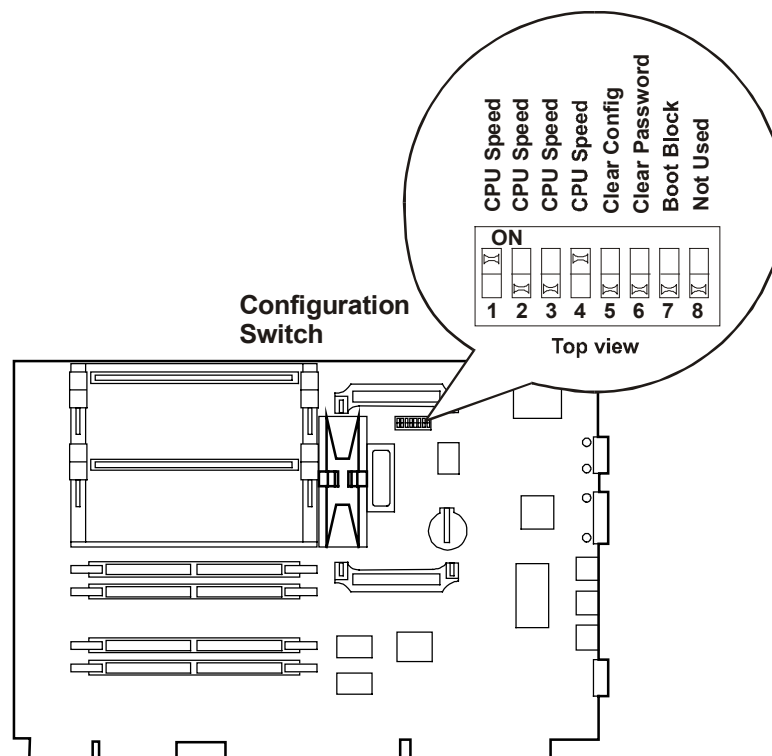
2. Power down the HP NetServer.
3. Disconnect the power cords and cables and, if necessary, label each one to support re-assembly.

**CAUTION** The power supplies will continue to provide standby current to the NetServer until the power is disconnected.

4. For both rack-mounted and pedestal models, remove the covers to gain access to the system board assembly.

**NOTE** In the LH 3000r, this assembly is under the right cover; in the LH 3000, it is under the top cover.

While you can clear the system configuration in the rack or in the pedestal, it is recommended that you remove the system board assembly to perform configuration changes



**System Board Assembly and Configuration Switch**

5. Move the configuration switch, switch 5 on the system board, to the "ON = CLEAR CONFIG" position.
6. Plug in the power cords, and turn on power to the HP NetServer. The following message appears:  
  
The configuration has been cleared. Set the Clear Config switch to the OFF position before rebooting.
7. Turn off power to the HP NetServer and unplug the power cords.
8. Return switch 5 on the system board to the OFF position.
9. Reconnect cables and power cords to the HP NetServer.

10. Close up the server.
11. Restore HP NetServer to normal operation.
12. Turn on power to the HP NetServer. The error message may be displayed:  
`0012-34: Incorrect System Configuration`
13. Press the **[F2]** function key and answer **Yes** to save the configuration, then exit the Setup utility.

## Password Problems

If you have forgotten the password, your HP NetServer will function normally, but you will not be able to change the system configuration settings in the Setup utility.

To reset the password, the procedure is the same for the rack-mount and the pedestal HP NetServers once you gain access to the system board assembly.

1. Log off all users and gracefully shut down the network operating system according to directions in your NOS documentation.
2. Power down the HP NetServer.
3. Disconnect the power cords and cables and, if necessary, label each one to support re-assembly.

<b>CAUTION</b>	The power supplies will continue to provide standby current to the NetServer until the power is disconnected.
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4. For both rack-mounted and pedestal models, remove the covers to gain access to the system board assembly.

<b>NOTE</b>	In the LH 3000r, this assembly is under the right cover; in the LH 3000, it is under the top cover.
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While you can reset the system password in the rack or in the pedestal, it is recommended that you remove the system board assembly to perform configuration changes.

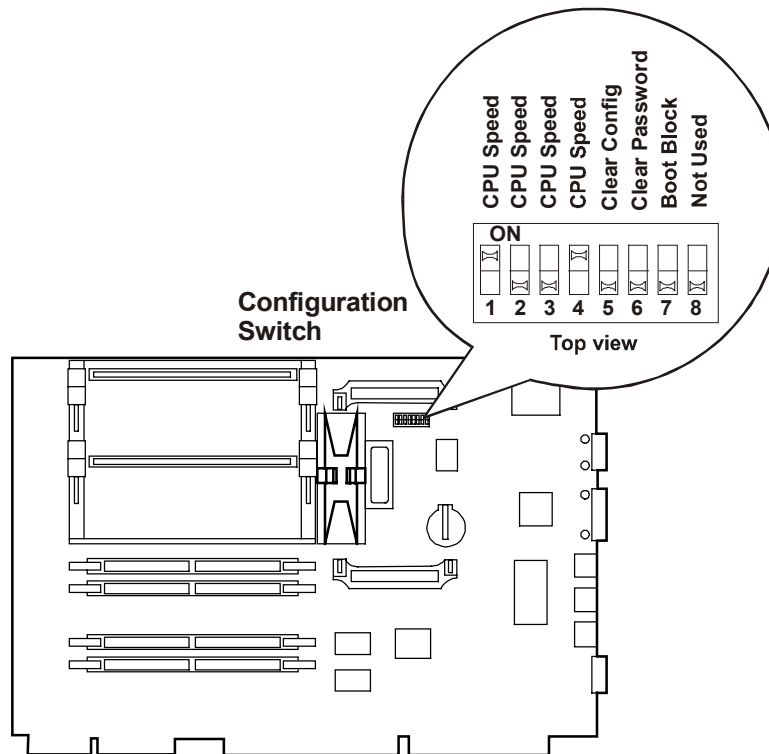
5. Move switch 6 on the system board (labeled "Clear Password") to the ON position.
6. Plug in the power cords. Turn on power to the HP NetServer and allow it to complete its startup routine. The old password will be erased.
7. Turn off power to the HP NetServer. Unplug the power cords.
8. Return switch 6 to the OFF position.
9. Reconnect cables and power cords to the HP NetServer.
10. Close up the server.
11. Restore HP NetServer to normal operation.
12. If you wish to set the password again, during the power-on system hardware test press the **[F2]** function key to start the Setup utility.
13. Set the new password in the Security menu.
14. Press the **[F10]** function key and answer **Yes** to save the configuration, including the new password.
15. Exit the Setup utility.

## BIOS Recovery

If the BIOS becomes corrupted, it is possible to perform a BIOS recovery to correct the condition. A BIOS Update diskette must be created from the HP NetServer Navigator CD-ROM to be used in flashing the new BIOS into the NetServer. To update the BIOS, you enable the Boot Block by setting the Boot Block switch (switch 7) of the configuration switch on the system board assembly to the ON (enabled) position.

To perform a BIOS recovery:

1. Power down the HP NetServer and gain access to the system board assembly.
2. On the system board, set the Boot Block switch (Switch 7), on the configuration switch, from OFF to ON.



**System Board Assembly Configuration Switch**

3. Replace the system board assembly.
4. Place the previously created BIOS Update diskette into the floppy drive of the HP NetServer and power up the HP NetServer.
5. The flash program on the diskette will re-program the BIOS into the HP NetServer.
6. When the flash programming is completed, power down the HP NetServer.
7. Gain access to the system board assembly and set the Boot Block switch (Switch 7) from ON to OFF.
8. Replace the system board assembly in the HP NetServer and replace all covers.
9. Power on the HP NetServer in the normal manner.



## Troubleshooting Checklist

These instructions do not generally cover third-party components or devices. Refer to the documentation that comes with the third-party device for diagnostic and troubleshooting information. When replacing the processor or system board, make sure all previously installed components are removed from the original processor or system board and are installed on the replacement board.

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**NOTE**

This information assumes that the customer is booting MS-DOS (note that DiagTools is based on MS-DOS). If the customer is not using MS-DOS, reboot the system with a DOS diskette.

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When troubleshooting:

- First make sure that the system is configured properly. Most system problems are the result of incorrect system and SCSI subsystem configurations.
- If it is a network-related error, determine if the user has enough memory and hard disk drive capacity. Run the diagnostics for the network interface cards. Consult with the network operating system manual.
- If it is a hardware error, follow the instructions to log users off the LAN and power down the server. Boot the **Power-on Self-Tests (POSTs)**. If you get an error, look up **Error Messages** for further instructions. If the POSTs pass, you can run the HP DiagTools. Besides the POSTs and HP NetServer DiagTools disk, the standard set of tools recommended for troubleshooting are:
  - ♦ **HP NetServer Assistant.** HP NetServer Assistant (NSA) is a customizable software toolset that helps monitor and manage servers over the network from an HP OpenView console. The NSA software has a server part and a management console, or client, part.
  - ♦ **TopTools.** HP TopTools provides a set of web-based management tools you can use to maintain and control your HP NetServers running Microsoft Windows NT, Novell NetWare/IntranetWare, or SCO UNIX.
- Always change one component—and only one component—at a time.
- Verify the error.

**Check for any general problems:**

1. Check that all cables and power cords are firmly plugged into the correct receptacles.
2. Check that all equipment connected to the HP NetServer is turned on.
3. Verify that power is available and is within specification.
4. Check that the HP NetServer is configured correctly in the Setup Utility by pressing **[F2]** during the boot process or by booting the *HP NetServer Navigator CD-ROM*.
5. If the server still doesn't work, turn off the monitor, the server, and all external devices. Note the location of all power cords and other cables before unplugging them. Then:
  - a. Remove the cover.
  - b. Check that all accessory boards are firmly seated in their slots.
  - c. Ensure that all mass storage power and flat cables are securely connected.
  - d. To verify that switches and jumpers on mass storage devices and boards are properly set, see the setup instructions in the mass storage device's manual.
6. Reconnect all cables.
7. Turn on the monitor.

8. Turn on the HP NetServer.
9. Verify the error.

## General System Problems

### No lights are on and no error message appears.

If the server does not work (no lights are on) and no error message appears, check the following:

1. Make sure that all cables and power cords are plugged into their proper receptacles.
2. Make sure that the AC outlet is working. If the server is plugged into a switched multiple-outlet box, make sure that the switch on the outlet box is turned on.
3. Make sure that the server is turned on (the power-on light should be green and the fans should be on).
4. Turn the server off, wait at least twenty seconds, then turn the server back on to see if the failure can be cleared.
5. Make sure that all boards are installed properly and the processor module or modules are installed in the correct slot. They must be seated firmly in their slots and any cables must be connected firmly.
6. If your server stopped working after you installed a new board, remove the board and turn on the server. If your server now works, determine how to set the jumpers and switches on the board if there are any. If the new board is preventing the server from powering on, it's apt to have a serious electrical problem.
7. If your server still does not work, remove all boards and options that you have installed (do not remove the flexible or hard disk drives) and turn on the server.
8. Add the boards and options one at a time to determine which one is causing the problem.
9. If you have added any memory, make sure that the DIMM modules are seated properly in the board.

### Power goes off on the server and doesn't come back on

When certain critical conditions exist, the server shuts down all power.

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**NOTE**

It is a good idea to run the Event Log Display Utility on the HP NetServer Navigator CD-ROM as part of regular maintenance procedures so that you can check to see if any problems have been logged to the file. Also, this file needs to be purged at times since the error log can eventually fill up. Errors are time stamped with either a Real-Time Clock (default) or the POST Capture time stamp. See the HP NetServer Navigator CD-ROM, NetServer Utilities menu, for additional information on this feature.

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The critical conditions that may shut down the server are:

- critical temperature fluctuations or changes
- voltage problems (external AC line)
- power supply failure

If the server powers off, and **before you try a restart**, do the following:

1. First check to make sure power is getting to the server. Plug a known working device into the power outlet.

2. Access the System Event Log (SEL) through the front panel LCD display. You can do this when the system is running, or you can do this while the system is powered down, but still plugged in (standby mode).
3. Review the **Troubleshooting Checklist** to check for basic server integrity.
4. Check for proper ventilation for the server. The server should have at least six inches of space around the front and back for proper airflow.
5. Check the system specifications and make sure the environmental temperature and voltage are in the specified guidelines.
6. Make sure all system fans are working.
7. Boot the HP NetServer Navigator CD-ROM and run the Error Logging utility. If the system powers up and immediately shuts down, CMOS might be corrupted. You may need to clear CMOS and reconfigure your system.
8. Check the error log and note which errors have occurred that shut down the system.

If you are having voltage fluctuation problems, go to **Power Problems**.

Note that temperature problems can also be caused by a fluctuating power supply.

Monitor the system to make sure you are not experiencing further temperature and voltage problems.

### The server stops working (hangs)

If the server stops working, do the following:

1. Review the **Troubleshooting Checklist** before you continue.
2. If the system hangs, power the system off and on, as it is a more complete reset rather than using **Ctrl+Alt+Del**.
3. If the POST find an error, check the connection and/or replace the faulty part.
4. If the problem persists, remove and replace the system board.
5. Once a problem has been found with a part, verify that it is the problem by duplicating the error.

### The server powers-off then powers on again by itself

The server has an Automatic Server Restart (ASR) feature that is set to enabled. The ASR feature is used with the NetServer Assistant product. When certain conditions occur the server shuts down all power, then twenty seconds later restarts the server. ASR is enabled as the default. You can disable this feature if you want. To read about the effects of automatic server restart, see the NetServer Assistant product. The conditions that shut down and restart the server are operating system problems that affect the system timers.

### The system does not start (boot)

Check that DIMMs are installed on the System Board. If the above are fine, do the following:

1. Review the **Troubleshooting Checklist** before you continue.
2. If memory problems are being experienced:
  - a. Power the system off and on as it is a complete reset instead of using **Ctrl+Alt+Del**.
  - b. If the POST finds a problem, check the error against the **Error Messages** and correct the problem.
3. Check that all DIMMs are installed correctly:
  - a. Check that the DIMMs comply with the **Memory Guidelines**.
  - b. Reseat the DIMMs on the system board.

4. To check that the system board is installed and configured correctly:
5. If the HP NetServer indicates there is not enough memory, and if the customer does not want to add memory, try these steps:
  - a. Disable any drivers that are not necessary for the application being run, and/or the network.
  - b. Delete memory resident or TSRs (terminate and stay resident) programs.

To solve the problem with steps 5a-5b, the customer must be willing to give up functionality in exchange for more memory.

6. For memory conflicts (two boards or drivers are trying to use the same memory addresses), change the addresses used by the memory

For information about the board addresses, see the Setup Utility.

7. Once a suspect part has been found, verify that it is the problem by reinstalling the part and duplicating the error.

## Memory Problems

The memory modules are DIMMs. Note that some HP NetServers require that memory must be installed only in certain sockets or banks, sometimes in multiples (for example, 2 or 4 at a time).

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<b>NOTE</b>	If the <b>POSTs</b> (displayed at power-on time) indicate a defective memory module. Replace the defective module.
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1. Review the **Troubleshooting Checklist** before you continue.
2. If memory problems are being experienced, power the system off and on. This performs a "cold" restart, rather than a "warm" restart (as it does when you press **Ctrl+Alt+Del**).
3. Check the System Event Log for messages indicating memory errors.
4. Run the **DiagTools** memory test.
5. Reseat the DIMMs.
6. To check that the modules are installed and configured correctly:
  - a. Run the Setup Utility and check the configuration.
  - b. Install one known good DIMM. If you still receive an error, replace the system board.  
  
If the error goes away, add another DIMM and reboot again. Continue this process until you have installed all DIMMs or you experience a failure.  
  
Replace the defective DIMM.
7. Once a suspect part has been found, verify that it is the cause of the problem by reinstalling the part and attempting to duplicate the error. Also install it in another memory socket to confirm whether or not the socket is defective.

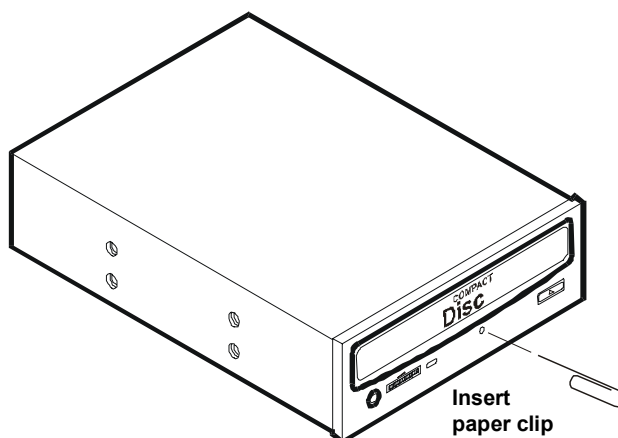
## CD-ROM Problems

### Symptoms:

#### The CD-ROM drawer will not open.

If the CD-ROM drawer fails to open when you press the Eject Button or with software commands, do the following:

1. Turn off all power to the computer.
2. To open the drawer, insert a pointed object, such as a paper clip, into the emergency eject hole and push in about 1.75 inches (40 mm).



3. Remove the disk and close the drawer.
4. After you remove the disk, start the computer and try to open the drawer again with the Eject Button or software commands.
5. If the drawer still will not open, replace the CD-ROM drive with a working unit.

#### The CD-ROM drive is not working properly.

If the CD-ROM drive does not work, do the following:

1. Review the installation guidelines in Chapter 2 to ensure a proper configuration.
2. In addition, check the following:
  - ♦ Check that the correct drivers are installed.
  - ♦ Check that there is a CD-ROM disk in the CD-ROM drive.
  - ♦ Check that all internal drive cables are securely attached and functional.
3. If the drive is a Hewlett-Packard CD-ROM, review the *CD-ROM Installation Guide* for any special installation instructions.
4. Try installing a known good CD-ROM drive
5. If the problem persists, check for environmental problems that can damage disk media and disk drive heads. Environmental problems result from:
  - ♦ Radiated Interference: Sources include communications and radar installations, radio/TV broadcast transmitters, and hand-held receivers.

- ♦ Airborne Contaminants: Sources include dust, smoke, and ashes. Steam from duplication equipment may result in intermittent disk errors.

### The NetServer won't boot from the CD-ROM.

Use the Setup Utility to make sure the CD-ROM drive is bootable:

1. Review the **Troubleshooting Checklist** and **Boot Device Priority** before you continue.  
Press <F2> to enter SETUP or <ESC> to enter Boot Menu
2. Press the Esc key. At the end of the Power-On Self-Test, a menu appears that looks something like this:  
  - 1. ATAPI CD-ROM Drive
  - 2. Removable Device
  - 3. Hard Drive
  - 4. Enter Setup Utility
3. Use your keyboard's arrow keys to select the boot device. Then press the Enter key. The system continues its startup sequence and boots from the device you selected.

## Flexible Disk Drive Problems

### Symptoms:

**There are lost clusters.**

**There are read/write errors.**

**The system will not start from a diskette.**

If you cannot boot from, write to, or format the flexible disk, do the following:

1. Review the **Troubleshooting Checklist** and read about **Boot Device Priority** before you continue.
2. Try booting from a known good flexible disk.
3. Check to see if boot from CD-ROM is enabled and if there is a bootable CD in the CD-ROM drive.
4. Select the Setup Utility (press **[F2]** during the boot process and check that the system's mass storage configuration is correct. If for some reason you cannot run the Setup, you can clear CMOS and reconfigure the server.  
Try to reboot.
5. If you cannot format or write to a flexible disk:
  - ♦ Verify that the diskette is not write protected.
  - ♦ Check that the disk drive is properly configured with the Setup utility. Make sure that "Start from Flexible Disk" option is disabled.
6. Check that all internal drive cables are securely attached and functional. Inspect the cables and reseat the connectors at both ends.
7. If the cables are securely attached, and the drive still does not work, replace the cables with known good cables, one at a time.

8. If the problem persists, and/or there is an error code, replace the faulty part (the drive, the system board, etc.)
9. If the problem persists, check for environmental problems that can damage disk media and disk drive heads.

Environmental problems result from:

- ♦ Radiated Interference: Sources include communications and radar installations (such as at an airport), radio/TV broadcast transmitters, and hand-held receivers.
- ♦ Airborne Contaminants: Sources include dust, smoke, and ashes. Steam from duplication equipment may result in intermittent disk errors.

## Keyboard and Mouse Problems

### Symptoms:

**The keyboard does not work.**

**A character is not displayed when a key is pressed.**

1. Review the **Troubleshooting Checklist** before you continue.
2. Make sure that the keyboard is not locked.
3. Make sure that the keyboard cable connections at the rear of the server and at the back of the keyboard are securely and correctly attached.
4. If a keyboard/monitor switchbox is used with this HP NetServer, plug the keyboard directly into the keyboard port of the HP NetServer. Verify the problem.
5. If the problem persists, turn off the server and back on by using the power button.
6. Try replacing the keyboard with a known good keyboard.
7. If the problem persists, check the keyboard cable for continuity, or try a known good cable.
8. If the problem persists, replace the system board.

**The mouse does not work or is intermittent.**

The HP NetServer automatically detects a mouse when one is installed. If the mouse or other input device is not working, perform the following:

1. Review the **Troubleshooting Checklist** before you continue.
2. Check that the mouse cable is properly and securely connected to the NetServer.
3. If a keyboard/monitor switchbox is used with this HP NetServer, plug the mouse directly into the keyboard port of the HP NetServer. Verify the problem.
4. Verify that the mouse's port does not have a resource conflict. Use the Setup Utility (press **[F2]**).
5. Verify that the correct mouse driver has been installed onto the boot drive. Refer to the mouse installation manual or the operating system manual.
6. Replace the mouse with a known good unit.
7. If the problem persists, replace the system board.

## Network Interface Card Problems

See the appropriate Network Interface Card documentation.

### Symptoms:

#### The adapter can't connect to the network.

1. Make sure the cabling is installed properly.  
Most hub and switch connections require straight-through cable; consult their documentation. If you're directly connecting two computers (with no hub or other device), use a "crossover" cable.
2. Verify that there are no resource conflicts between the NIC and any other accessories in the HP NetServer. Check the Setup Utility.
3. Check any LEDs on the adapter at the back of the computer to see if they show activity. No activity on the LEDs probably indicates a bad network cable, hub connection or other network error.
4. Make sure you're using the latest and correct drivers. Make sure the drivers are intended for this adapter.
5. Make sure the port on the switch or hub (or other device) has the same duplex setting as the adapter.  
If you configured the adapter for full duplex, make sure the switch port is also configured for full duplex. Setting the wrong duplex mode can degrade performance, cause data loss, or result in lost connections.
6. Test the adapter as directed in the installation tasks for each operating system. Also check the "README" files on the support disk.

## Power Problems

### Symptoms:

#### A fan is not working.

#### The power LED does not light.

1. Review the **Troubleshooting Checklist** before you continue.
2. Verify that the AC power source is good:
  - a. If the system fans are audible or a control panel light is on, the power is on.
  - b. Verify the circuit breaker for the AC power outlet.
  - c. If the breaker was off, check that all devices connected the HP NetServer share the same circuit breaker and are the only devices on it. Reset the circuit breaker after reconfiguring the devices, if need be.
  - d. Verify that the AC power outlet is not faulty. Test it by plugging in a known-good device.
  - e. Verify that the third-wire ground is isolated from other grounds and is at ground potential.
3. Verify all cable connections:
  - ♦ AC power cords from AC source outlet to server.
  - ♦ DC Power supply cables to all HP NetServer PCBs



♦ DC power supply cables to disk drives and/or mass storage cages

4. If the fans aren't audible and the above steps are verified, check that power is getting to all fans. HP NetServers have multiple fans. All fans run when power is turned on; all are off when power is off.

With the power supply connected to the system board, check the power supply's voltages.

5. If voltages are not present:
  - a. Turn off AC power.
  - b. Disconnect the power cords for 10 minutes in order to reset the power supply's circuitry.
  - c. Turn on AC power again.

If power is still not getting to the system board, replace the power supply (or power supply module on some HP NetServer models).

6. If power is getting to the fan but the fan isn't working, replace the fan (or replace the power supply in HP NetServer models with fans incorporated in the power supply).
7. If the problem continues, replace the power supply module.
8. If, after replacing the power supply, the problem persists:
  - a. Remove all accessory boards, including any hard disk drive controller board or the video board the customer might have installed, and reboot the system.
  - b. Disconnect all mass storage power cords and cables (except those to the boot device) and reboot the system.
9. If the problem goes away, reinstall the original suspected part to verify that it is causing the problem.

## SCSI Subsystem Problems

### Symptoms:

**The external SCSI subsystem does not work after installation.**

If the external SCSI subsystem does not work after installation, do the following:

1. Review the **Troubleshooting Checklist** and read "Mass Storage Guidelines" section in Chapter 2.
2. Run the **DiagTools** and verify the integrity of the SCSI buses, and other switch settings on the external storage devices are correct. Verify that each SCSI device is assigned a unique SCSI ID.
3. Refer to the documentation that came with the SCSI devices for any specific information on installing them.
4. Make sure that any installed SCSI controller is installed and configured correctly.
5. For any SCSI devices installed in an enclosure external to the HP NetServer chassis, make sure that Ultra SCSI is disabled on this controller. SCSI devices external to the HP NetServer chassis are supported in Fast SCSI mode only.
6. Check the SCSI cables for problems that may have been caused by recent computer maintenance, hardware upgrades, or physical damage.
7. Check the ROM BIOS version to make sure it is the most recently issued version. Booting the most recent version of the *HP NetServer Navigator CD-ROM* will automatically report if the

BIOS is not current and needs updating (“flashing”). Follow the instructions in the screen to update the BIOS.

8. Check that the external SCSI subsystem BIOS is being executed properly.
  - ♦ When you start the server, the incrementing count of the RAM appears on the screen. Then the external SCSI BIOS displays a banner and a copyright notice.
  - ♦ The BIOS then checks for valid devices on the SCSI bus, and reports which devices are found. If you have installed and configured the SCSI devices correctly, you will see a list confirming all SCSI devices installed in the system.
  - ♦ If the banner is not displayed the external SCSI controller is not recognized.
9. Verify that the SCSI bus is terminated at both ends. By default, HP SCSI controllers are terminated. When a device is connected to a connector on the controller, bus termination for that connector is disabled. Verify that the last device on the bus is terminated.

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**NOTE**

When using LVD SCSI (often referred to as Ultra2 SCSI), termination is typically provided at the controller and the far end of the cable.

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10. Make sure that no device is set to SCSI ID7; this is the SCSI ID used by the SCSI controller.
11. Verify that all SCSI devices are all LVD (low voltage differential) SCSI and that no SE (single-ended SCSI devices have been added). Note that SE devices will work on an LVD bus, but performance will be degraded.
12. Verify that the SCSI hard disk drive that loads the operating system is set to the lowest SCSI address (usually set to 0).
13. Go into the SCSI Configuration Utility and set the transfer rate lower. The internal and external SCSI subsystems are typically LVD and will be set to default at the maximum 80 MB/sec. If the SCSI system works at lower transfer rate, you may infer a connector problem. Try cleaning and reseating the SCSI cable. Try another cable.

To change the transfer rate for a SCSI device:

- a. Press **[CTRL]** and **[C]** keys when prompted to enter the SCSI utility.
  - b. Select either the internal or external SCSI controller. The internal SCSI channel is usually port 2000. Press **[Enter]**.
  - c. After the utility scans the channel, it will list SCSI devices detected. You may change the transfer rate for a specific device by selecting it, or for the entire channel by changing the controller. Make your selection and press **[Enter]**.
  - d. Press **[Enter]** on Sync Rate to select a new transfer rate.
  - e. Follow the prompts to save the new setting and exit the utility.
14. If a second hard disk drive is connected to the SCSI cable, check it for proper SCSI address, SCSI cable connection, proper power, and jumper settings.
  15. Disconnect all SCSI devices except the integrated SCSI adapter and the drive at SCSI address 0, and try again. If this fails, try substituting a known good SCSI adapter board and a good hard disk drive.

### The SCSI BIOS has trouble loading.

If the server has trouble loading the SCSI BIOS, do the following:

1. Review the **Troubleshooting Checklist** before you continue.

2. If you installed more than one SCSI controller, make sure that the BIOS for all controllers except for the boot controller are disabled. This lets the SCSI BIOS for the boot controller load.
3. Determine what the boot device priority is for the HP NetServer model. Verify that the boot device is set to the correct priority.

**The SCSI subsystem does not work at installation.**

Many SCSI problems are caused by an incorrect configuration rather than by faulty hardware. If the SCSI subsystem does not work after installation, do the following:

1. Review the **Troubleshooting Checklist** and "Mass Storage Guidelines" section in Chapter 2 before you continue.
2. Run the **DiagTools** and verify the integrity of the SCSI buses, and other switch settings on the external storage devices are correct. Verify that each SCSI device is assigned a unique SCSI ID.
3. If you don't see the SCSI BIOS banner during system start:  
"Symbios, Inc. SDMS TM V4.0 PCI SCSI BIOS PCI Rev. 2.0, 2.1"  
"Copyright 1995, 1998 Symbios, Inc."  
"PCI-4.14.04"  
and the final message "SCSI BIOS successfully installed" after devices are displayed:
  - ♦ Check the cable connections.
  - ♦ Check the SCSI termination.
4. Run the Setup Utility or SCSI Configuration Utility and verify that the SCSI host bus adapter (HBA) is properly configured.  
The HBA is usually SCSI ID 7.
5. If you installed more than one SCSI adapter, verify that each adapter is set to a separate BIOS address; or disable the BIOS on all of the adapters except one.
6. For each device, check:
  - ♦ That each device has a unique SCSI address.
  - ♦ In general, when selecting an address for a drive (default address is 0), select the lowest possible address.
  - ♦ Check that the device's jumpers are set according to the device documentation.
7. Check that the primary SCSI hard disk drive is set to the lowest address (usually set to 0). Each device (the HBA is also a device) must have a unique and separate SCSI ID number. To solve this problem, simply set the device ID to something other than that of the HBAs SCSI ID (7). If the device is a boot drive, then the SCSI ID should be set at 0.
8. Go into the SCSI Configuration Utility and set the transfer rate lower. The internal and external SCSI subsystems are typically LVD and will be set to default at the maximum 80 MB/sec. If the SCSI system works at lower transfer rate, you may infer a connector problem. Try cleaning and reseating the SCSI cable. Try another cable.  
To change the transfer rate for a SCSI device:
  - a. Press **[CTRL]** and **[C]** keys when prompted to enter the SCSI utility.
  - b. Select the either the internal or external SCSI controller. The internal SCSI channel is usually port 2000. Press **[Enter]**.

- c. After the utility scans the channel, it will list SCSI devices detected. You may change the transfer rate for a specific device by selecting it, or for the entire channel by changing the controller. Make your selection and press **[Enter]**.
- d. Press **[Enter]** on Sync Rate to select a new transfer rate.
- e. Follow the prompts to save the new setting and exit the utility.
- 9. If another hard disk drive is connected to the SCSI bus, check it for unique address, SCSI cable connection, and power connection.
- 10. Check the SCSI bus cable for correct orientation, alignment, and seating on the SCSI adapter and the SCSI device.
- 11. Check for the correct Hewlett-Packard internal and external SCSI cables.
- 12. Check that all SCSI devices are connected to power and power-on all SCSI devices before or at the same time as the HP NetServer to ensure a stable SCSI bus.
- 13. Watch the boot screen for all SCSI devices to be displayed. For example, in a system with 1 SCSI controller and 2 hard disk drives (one with ID 0 and one with ID 1), if a valid device is found at device address 0, but not at address 1, you would see these device validation lines on the boot screen:

Channel x, SCSI ID #n - id info - Drive C: (80h)

If you see this message:

- a. Verify that the SCSI hard disk drive is set to address 1.
- b. Check the SCSI bus cable for correct orientation, alignment, and seating on the host adapter and the hard disk drive.
- c. Verify that terminators are installed at each end of the SCSI bus, but not on any other devices. The hot swap cage printed circuit board has automatic termination that disconnects when a cable is attached.
- d. Verify that all SCSI devices on the bus are appropriate for that bus (only single-ended SCSI devices on the single-ended bus, only differential SCSI devices on the differential bus).
- 14. If the server still fails to recognize the SCSI drive, disconnect all SCSI devices except the host adapter and the drive at SCSI address 0 and try again. If the system fails, try substituting a known good hard disk drive.
- 15. If the SCSI BIOS has properly identified device 0 and has installed it as drive C, but cannot find a device at address 1, and in addition, if no further messages are displayed, it indicates the server cannot load the operating system from device 0, check the following:
  - a. If a second hard disk drive is connected to the SCSI bus, check it for proper address selection, SCSI cable connection, and proper power.
  - b. Check the disk partition.
  - c. Partition the hard disk drive if required.
- 16. Use only SCSI devices without built-in terminators.

The HP NetServer embedded controllers are terminated automatically on the hot swap cage or at the end of the SCSI cable. If you are installing a SCSI device that uses a built-in terminator, you must remove the terminator from the device before proceeding with the installation.

Use only the HP NetServer SCSI cables for the SCSI hot swap subsystem.

- 17. Check that all SCSI devices LVD (low voltage differential) SCSI and that no SE (single-ended) SCSI devices have been added to the bus.

Hot-swap drives shipped by HP are set for LVD operation. Drives set for SE operation may

used, but they will slow down the transfer rate considerably. Please refer to the user documentation for the device to determine which device you are using.

<b>CAUTION</b>	Don't use high voltage differential SCSI devices, they can destroy circuitry on LVD and SE devices.
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18. Disconnect all SCSI devices except the SCSI adapter and the drive at SCSI address 0, and try again. If this fails, try substituting a known good SCSI adapter and disk drive.
19. Use the Setup Utility to check for resource conflicts, especially if new boards or accessories have been added.

### The SCSI subsystem stops working.

If the SCSI subsystem should stop working, do the following:

1. Review the **Troubleshooting Checklist** and "Mass Storage Guidelines" in Chapter 2 before you continue.
2. Run **DiagTools**. Verify that the SCSI ID and other switch settings are correct and get specific information or verification that the problem is the SCSI bus.
3. If an accessory board was added recently, check if there is a resource conflict between the new board and an existing accessory board. Also, if you have changed the options on an existing board, there may be a resource conflict.
  - a. Remove the new board and restart the computer. If this corrects the problem, the board is either defective or it is trying to use a system resource used by the SCSI subsystem.
  - b. Check if the board is using memory, I/O addresses, or interrupt lines that are also used by the SCSI subsystem.
4. Check to see if there have been recent changes to any software. For example, has anyone moved, removed, or changed the configuration files or drivers? Refer to the software documentation for more information.
5. Check the SCSI cables for problems that may have been caused by recent computer maintenance, hardware upgrades, or physical damage.
6. If you suspect hardware failure and there are no system error messages, check each component associated with the failure. Equipment failure is probably the most unlikely reason for a SCSI subsystem failure.
7. Check the ROM BIOS version associated with the SCSI controller to make sure it is the most recently issued version.

## Video/Monitor Problems

### Symptoms:

**Nothing is displayed on the monitor.**

**The monitor is blank and the computer beeps.**

**The wrong size characters appear on the monitor.**

**Colors are wrong or there are no colors on the monitor.**

If you installed a video board and are not using the built-in video system, go to Step 12.

If you have two video monitors connected, test the monitors to make sure they are working (Step 1-4) then go to Step 10.

**NOTE**

The system BIOS will beep if no video hardware is detected. This happens when the on-board video is disabled and there is no video adapter board installed.

1. Review the **Troubleshooting Checklist** before you continue.
2. Check the contrast and brightness controls to make sure they are adjusted.
3. Verify the video and power cords are connected to the monitor.
4. Make sure there is adequate power:
  - a. Check that the display power switch is turned on.
  - b. Check that the display power cord is connected to an AC power outlet and the video cable connected to the server's video connector.
  - c. Plug in a known working device to make sure there is power to the outlet or use the proper testing device to check the power outlet.
  - d. Turn the monitor off and on, and if the monitor has a power LED, see if it lights.
  - e. Turn the Clear Configuration switch on the system board to OFF and reboot the system. Check if the problem persists.
5. Turn on the HP NetServer and wait a full 2 minutes. Check that the monitor starts displaying normally.
6. If the problem persists, and if the power cord is detachable, try a known good power cord.
7. Unplug the power cord and wait 30 seconds. Plug in the power cord and turn on the HP NetServer. Wait a full 2 minutes. Check that the monitor starts displaying normally.
8. Check the monitor display to see if the system memory count takes place correctly.
  - a. Turn the server off and then on. Check to see if the memory is counted during the server boot. If no count occurs, go to Step 10.
  - b. Check to see if the count occurs in the color appropriate for the monitor.

If the count occurs in the wrong color, the problem may be with the video subsystem, the monitor, or the monitor cable. (Continue with the troubleshooting steps.)
9. If you are using a video screen saver utility and the screen goes blank while using the keyboard, you may be using an application that turns off the screen even when you are using the keyboard. Refer to the manual that came with the screen saver utility.
10. Make sure the memory modules (DIMMs) are correctly seated in their slots. You may want to remove and reinstall the memory modules to make sure that they are not causing the problem. Verify that the correct type, size, and combinations of modules for this model HP NetServer are installed.
11. To see if the display is functioning:
  - a. Turn off the monitor and the server.
  - b. Disconnect the video cable from the video connector.
  - c. Turn on the monitor.

**Monitor Notes:**

- ♦ When most EGA and VGA monitors are disconnected from the video connector, if the monitor is working, the screen is white.

- ♦ When some monitors (such as HP high-resolution monitors) are disconnected from the video connector, the monitor may be working, although the screen is black.
  - ♦ If the display is black or white when it should be in color, check the monitor cable to see if a pin is bent. If a pin is bent, slowly but carefully straighten the pin. Replace the cable if the pin cannot be straightened successfully.
  - ♦ If a monitor tester is available, use it to check the display.
  - ♦ If you suspect the monitor is faulty, replace it with a known good monitor. Then reinstall the original monitor and duplicate the error.
12. Verify that the monitor is working by plugging it into a know-good HP NetServer or computer.
  13. Check to see if the monitor connector's pins are bent. If the pins are bent, slowly but carefully straighten them.
  14. Connect the monitor cable to the HP NetServer video connector and turn on the HP NetServer. If there is a display, but characters are the wrong size or the display is the wrong color:
    - a. Check whether the monitor is a color or monochrome monitor.
    - b. Check that the video cable is properly inserted in the connector on the back of the computer.
    - c. Check for bent pins on the connectors.
  15. If the customer has installed a video board instead of using the built-in video, make sure all jumpers and switches are set properly on the installed video board. (See the manual for the video board.)
  16. If the monitor displays a badly scrambled image that looks to be the current screen image, then the monitor is not synchronizing correctly.
    - ♦ If a video board is installed, replace it with a known good one. The video timing setting on the board may be bad.
    - ♦ If it is the on-board video, replace the system board.
  17. If a video board is installed and the built-in video is used:
    - a. Make sure the video board/built-in video combination is supported. Usually, two video systems (for example, internal video and a video adapter board) cannot be used at the same time.
    - b. If there is still a problem, make sure the board is seated correctly.
    - c. If there is still a problem, remove the video adapter board, and enable the internal video system. Verify the problem.
  18. If a message appears such as "INVALID CONFIGURATION", run the **Setup Utility** and press **[F2]** during the boot process or boot the HP Navigator CD-ROM) to confirm the server video configuration. Make sure other accessory boards do not use the same memory addresses as the HP video system.
  19. If the problem is isolated to the built-in video system, replace the system board.

## Configuration Problems

### Symptoms:

An installed driver cannot find a PCI board.

Installing a PCI board which bridges the two system PCI buses (certain adapter boards provide this feature) can cause previously installed PCI drivers to not recognize their adapter board(s).

To resolve the configuration problem, move the PCI board that has bridging capability to a primary PCI slot.

#### **The configuration cannot be saved and the battery loses power.**

Refer to this section if the server frequently loses date and time that may be caused by the battery losing power.

1. Review the **Troubleshooting Checklist** before you continue.
2. If the system frequently loses the time and date, replace the battery. The battery is attached to the system board.
3. Set the new date and time, and reset the configuration parameters using the Setup Utility, if necessary.
4. Turn off AC power to the HP NetServer, then reboot to see if the date and time was saved.
5. If date and time are still requested, and the battery is good, perform the next procedure.

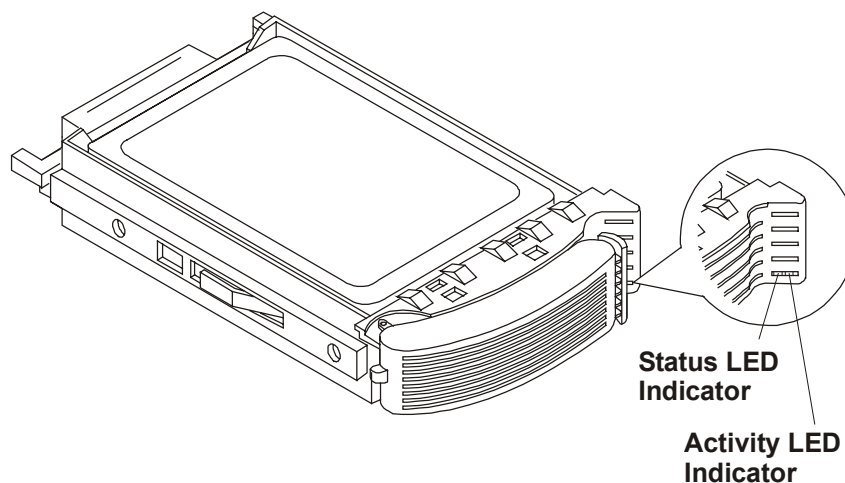
#### **The configuration information is frequently lost and the battery is good**

If the battery is good and you cannot save system configuration, do the following

1. Review the **Troubleshooting Checklist** before you continue.
2. Configuration information is saved in the CMOS. If you continue to loose configuration information and the battery is good, or you cannot save the information to the CMOS:
  - a. If possible, using the configuration utility, save the current configuration to a diskette.
  - b. Replace the system board.

## **Verifying Hard Disk Drive Operation**

Each Ultra2 hard disk drive module has two LED indicators on its front, one for status and one for activity.



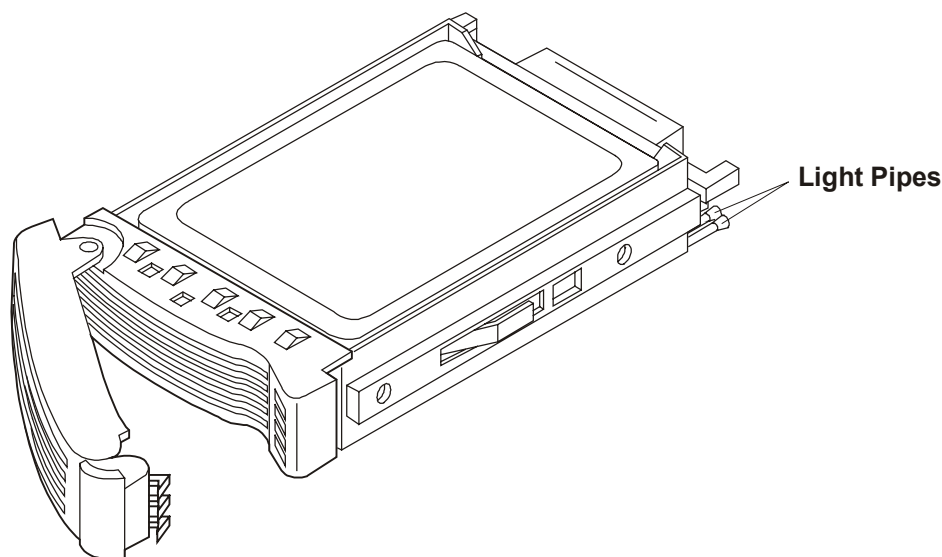
#### **LED Apertures on Ultra2 Hard Disk Drive Module**

Light pipes on the module transmit light to these apertures from LEDs on the inside rear of the hot-swap mass storage cage. Verify that the LEDs show the correct status and activity indications for all disk drive modules that you installed:

1. Turn on power to the HP NetServer and display monitor.



2. During the Power on Self-Test (POST) early in the boot sequence, watch the two LEDs on each hard disk drive module.
  - ◇ **Status LEDs:** All LEDs quickly cycle from amber to steady green.
  - ◇ **Activity LEDs:** All LEDs quickly cycle from amber to green. The LED stays steady green until the drive spins up.
3. If no LEDs were illuminated on any disk drive modules, the power harness may not be correctly connected. Check it as follows:
  - a. Turn off the HP NetServer power switch and unplug the AC power cords and any telephone cables. Remove the fan assemblies.
  - b. Disconnect the P2 connector of the power harness, and then reconnect it.
  - c. Replace the fan assemblies. Reconnect the AC power cords and any telephone cables.
  - d. Restart the HP NetServer to determine whether the LEDs now become illuminated during the POST. If not, contact your reseller.
4. If one or both LED indicators on a single module are not illuminated during the POST, the module may be installed incorrectly, or its light pipes may be damaged.



**LED Light Pipes on Ultra2 Hard Disk Drive Module  
(Shown for Low-Profile Disk Module)**

Check the light pipe on the module as follows:

- a. Remove the disk drive module.
- b. Inspect the light pipes for damage. If a light pipe is damaged, contact your reseller.

**CAUTION**

The light pipes are fragile. Be careful not to damage them when you inspect them or when you reinsert the module.

- c. Reinstall the disk drive module.
- d. Restart the HP NetServer to determine whether the LEDs become illuminated during the POST now. If not, contact your reseller.

## Processor Problems

Certain HP NetServer modules contain diagnostic LEDs that indicate memory errors, processor module errors, or processor voltage regulator module (VRM) errors.

1. Remove and reseal the processor module(s).
2. Remove and reseal the VRM(s).
3. Verify that the processor speed switches are set correctly.
4. Replace each of these components, one-at-a-time, with a known-good one, and retest the system:
  - VRM
  - Processor
  - Processor board (if so equipped)

**CAUTION**

Do not push on any components on the VRM; push on the edge of the main board only. Pushing on this device may break it.

If the fault persists, replace the system board.

## Printer/DataComm Problems

**Symptom:**

**A printer does not print or DataComm devices are not working.**

If the printer does not work, or the DataComm devices are not working, do the following:

1. Review the **Troubleshooting Checklist** before you continue.
2. Verify the correct cables have been used, the cables are connected properly, and the cable pins are not bent.  
  
Check the cable for continuity, or try a known good cable. Refer to the peripheral's manual.
3. Verify that the AC power cord is plugged into the power source and the printer.
4. Make sure that the printer power switch is on.
5. Make sure that the AC outlet is working. If the printer is plugged into a multiple-outlet box, make sure the switch on the outlet box is turned on, and the circuit breaker (if equipped) is not tripped.
6. Make sure that the printer is on-line.
7. Examine the printer for a paper jam.
8. Run the printer internal self-test (if it has one) to make sure that the printer is functional. Refer to the printer's manual for instructions.
9. Make sure that you have selected the correct port setting when you configured the printer. The printer must be configured correctly for the server and for the application. You may need to change some switch settings on the printer.
10. Make sure that you have not disabled the I/O ports. Run the Setup Utility (press **F2** during the boot process) and verify the I/O port status.

11. Make sure the server's printer port is working properly by running another peripheral from that port.
12. If the printer still does not work, it may have a resource conflict with another board or accessory. Remove boards and accessories (except the hard disk drive) one at a time to isolate the conflict. Check the printer for proper operation after you remove each board or accessory.
13. If an error message appears on the screen, refer to **Error Messages** and the printer's manual for help.
14. If the system was working before you installed the accessory, remove the accessory and restart the system.
15. If the problem persists, replace the system board.



## 6 Replacing Parts

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### Safety Information

Follow the procedures listed below to ensure safe handling of components and to prevent harm to both you and the server:

- Use an anti-static wrist strap and a grounding mat, such as those included in the Electrically Conductive Field Service Grounding Kit (HP 9300-1155).
- Handle accessory boards and components by the edges only. Do not touch any metal-edge connectors or any electrical components on accessory boards.
- Do not wear clothing subject to static charge build-up, such as wool or synthetic materials.

<b>WARNING</b>	Hazardous voltages are present inside the server. ALWAYS remove AC power from the System Processing Unit and other associated assemblies while working inside the unit. Serious injury may result if this warning is not observed.
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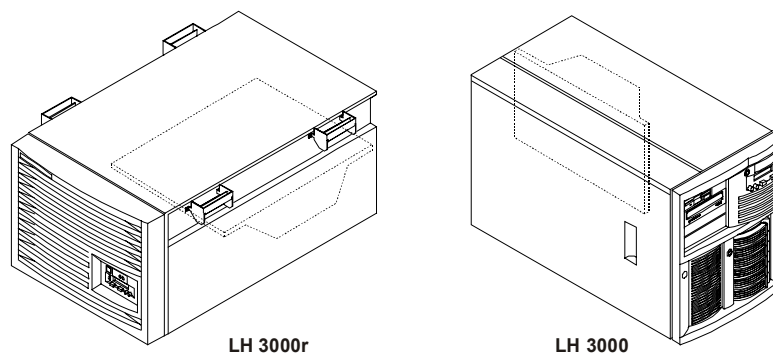
### Service Tools Required

Service of this product may require one or more of the following tools:

- Electrically Conductive Field Service Kit (P/N 9300-1155)
- CE Peripheral Exerciser Disk Kit (45935-63210)
- Datacomm Test Hood, 9-pin (24540-60010)
- Datacomm Test Hood, 25-pin parallel (24540-60011)
- 1/4 inch Flat Blade Screwdriver
- ACX-15 Torx® Screwdriver

### Replacing the Bezel

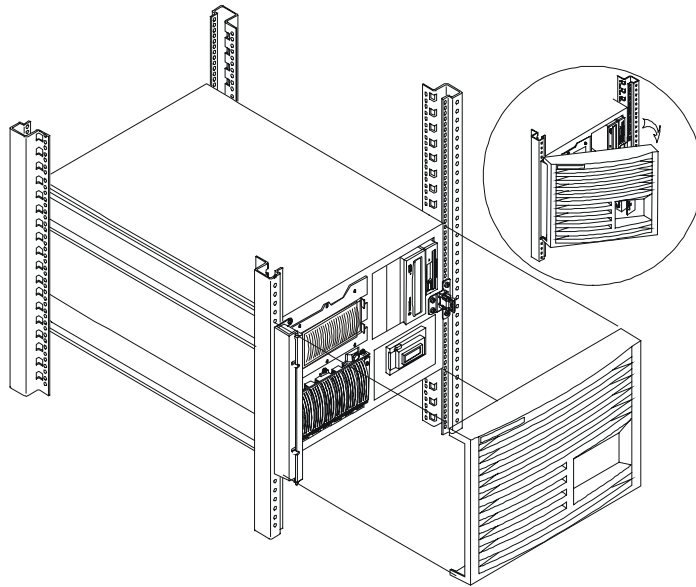
To remove and replace the front bezel on both models of the HP NetServer, LH 3000r and LH 3000 perform the following procedures.



HP NetServer's Front Bezel

## Removing the Bezel – Rack Mount

Remove the bezel from the front of the NetServer by swinging the bezel open (past 90 degrees) until it releases from the three posts on the bezel hinge.



Removing the HP NetServer LH 3000r Bezel

## Replacing the Bezel – Rack Mount

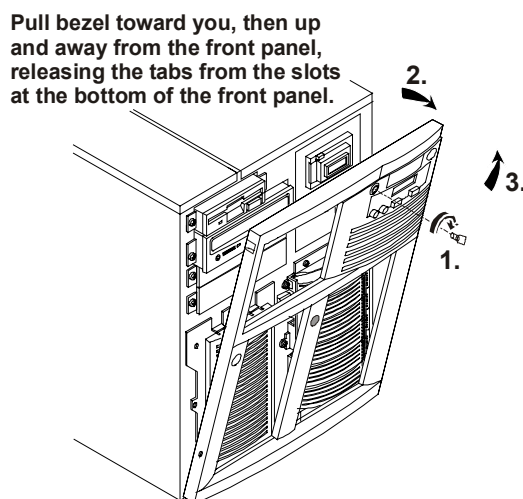
Replace the bezel by holding the bezel at 90 degrees to the left side of the NetServer. Snap the bezel clamps onto the hinge posts by pressing the bezel onto the hinge. When the bezel is snapped into place, swing the bezel closed.

## Removing the Bezel – Pedestal

1. Unlock the bezel, using the supplied key.

The bezel connects to the chassis with two snap-in connectors inside its top left and right corners and two tabs that fit into two slots on the bottom of the chassis.

2. Remove the bezel.
  - a. Pull bezel toward you until it unsnaps.
  - b. Lift the bezel forward and upward from the chassis face.



Removing the HP NetServer LH 3000 Bezel

### Replacing the Bezel – Pedestal

1. Replace the bezel by placing the two tabs at the bottom of the bezel into the corresponding slots on the chassis and snapping the bezel into position at the top of the chassis.
2. Lock the bezel, using the supplied key, and remove the key from the front of the NetServer.

### Replacing the CD ROM Drive

Replace the CDOM drive only after you have verified that is failing with **DiagTools**. POST error codes suggesting floppy disk drive problems are usually caused by problems on the system board.

1. Log off all users. Back up files. Follow instructions in your network operating system (NOS) documentation to gracefully shut down all networking software and applications.
2. Press the power switch on the HP NetServer's control panel when prompted by the operating system.
3. Disconnect the power cables.

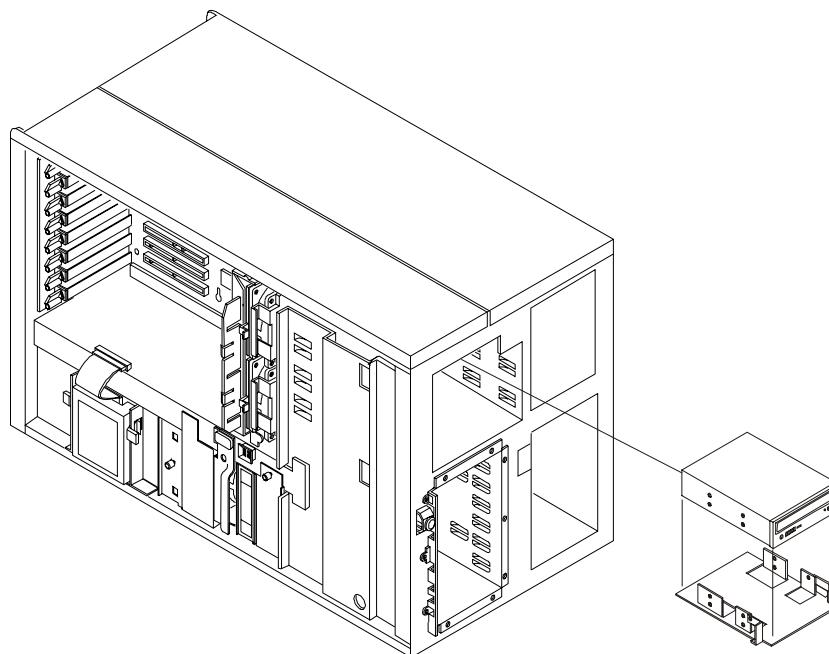
<b>WARNING</b>	The power supplies will continue to provide standby current to the NetServer until the power cable is disconnected.
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4. If you have a rack-mounted LH 3000r, then consider removing the signal cables from the rear of the enclosure before extending the enclosure on the slides (if you don't have a cable management arm). If necessary, label the signal cables to support re-connecting them.
5. Remove the top cover (rack-mount orientation) or the side cover (pedestal version).

<b>CAUTION</b>	Wear a wrist strap and use a static-dissipating work surface connected to the chassis when handling components. Ensure that the metal of the wrist strap contacts your skin.
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6. Remove the bezel. If necessary, temporarily remove the I/O fans.
7. Disconnect the signal cable (ribbon cable) and the power cable from the rear of the CD-ROM drive.

8. Use the T-15 driver to remove the two screws holding the CD-ROM drive to the front of the chassis. .



**CD ROM Drive Removal**

9. Slide the CD ROM drive forward and out of the chassis.

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**NOTE** The CD ROM drive connectors are keyed. Make sure they are fully seated.

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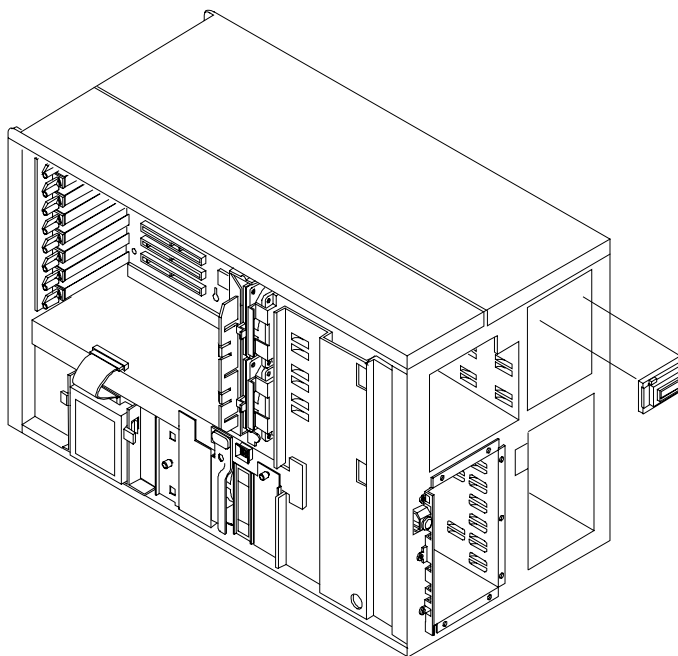
## Replacing the Control Panel

1. Log off all users and if necessary back-up files.
2. Follow instructions in your network operating system (NOS) documentation to gracefully shut down all networking software and applications.
3. Press the power switch on the HP NetServer's control panel when prompted by the operating system.
4. Disconnect the power cables.

<b>WARNING</b>	The power supplies will continue to provide standby current to the NetServer until the power cord(s) is/are disconnected.
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5. Remove the right hand panel (top on rack version) to access the control panel cable.
6. Remove the control cable connected to the I/O board.
7. Remove the cable from the cable harness and pass the end through the opening between the non-hot swap cage and the Hot Swap mass storage cage.
8. Use the T15 driver to remove the two screws that hold the control panel to the chassis.





**Control Panel Board Location**

9. To install the Control Panel Board, reverse Steps 1-8.

## Replacing Memory

### NOTE

If a DIMM is not recognized by the NetServer during boot; consider reseating it in the socket before replacing it with another DIMM.

In the event of a DIMM failure, removal and replacement is simple. Be sure to refer to the following "Memory Configuration Guidelines".

### CAUTION

The EDO DIMMs and PC 100 SDRAM from earlier HP NetServer models will fit into the DIMM sockets in the NetServer LH3000r/LH3000, but the EDO DIMMs and PC 100 SDRAM will not function properly. Use only 133 MHz SDRAM DIMMs acquired from HP.

Use this procedure to remove DIMMs from the HP NetServer's system board. The HP NetServer must be powered down and the appropriate cover must be removed from the HP NetServer, before removing any DIMMs.

1. Log off all users. Back up files. Follow instructions in your network operating system (NOS) documentation to gracefully shut down all networking software and applications.
2. Press the power switch on the HP NetServer's control panel when prompted by the operating system.
3. Disconnect the power cables.

### WARNING

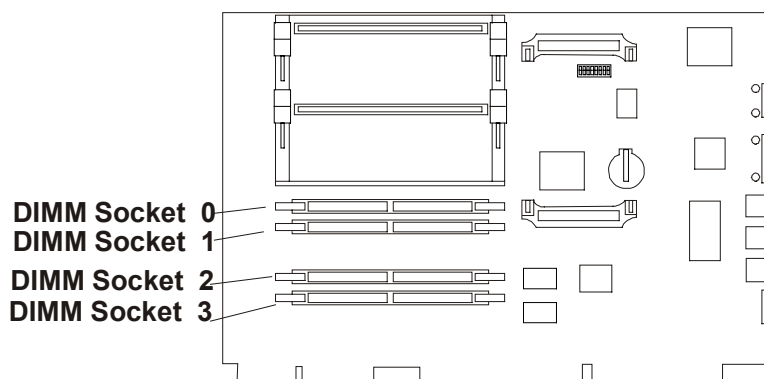
The power supplies will continue to provide standby current to the NetServer until the power cable is disconnected.

4. If you have a rack-mounted LH3000r, then consider removing the signal cables from the rear of the enclosure before extending the enclosure on the slides (if you don't have a cable management arm). If necessary, label the signal cables to support re-connecting them.
5. Remove the top cover (rack-mount orientation) or the side cover (pedestal version).

**CAUTION**

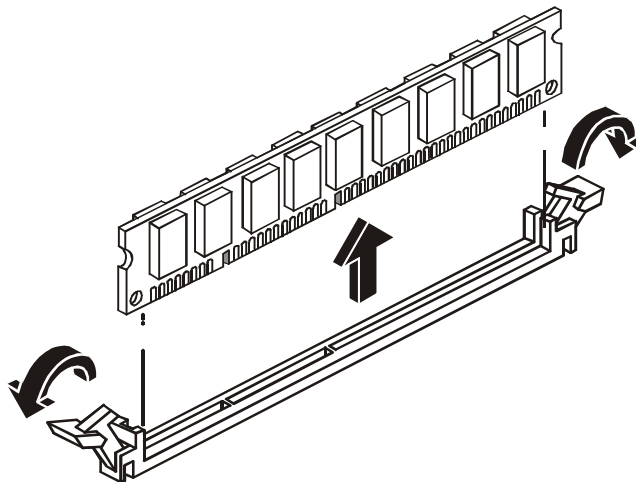
Wear a wrist strap and use a static-dissipating work surface connected to the chassis when handling components. Ensure that the metal of the wrist strap contacts your skin.

6. Locate the DIMMs on the system board.



**DIMM Locations**

7. To remove the DIMM, open the retaining clips at the side of the DIMM and lift it out.



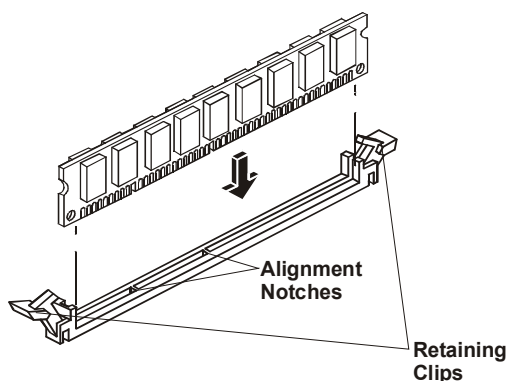
**Removing a DIMM**

## DIMM Replacement

**CAUTION** Wear a wrist strap and use a static-dissipating work surface connected to the chassis when handling components. Ensure that the metal of the wrist strap contacts your skin.

1. Remove the HP DIMM from its container, handling the module by its edges.
2. Locate the DIMM socket for installation and spread the two retainer clips.
3. Align the notches on the DIMM with the keys on the socket and hold the DIMM at a 90° angle to the system board.
4. Insert the DIMM fully into the socket. Close the retaining clips on the sides of the DIMM socket by moving them to the upright position.

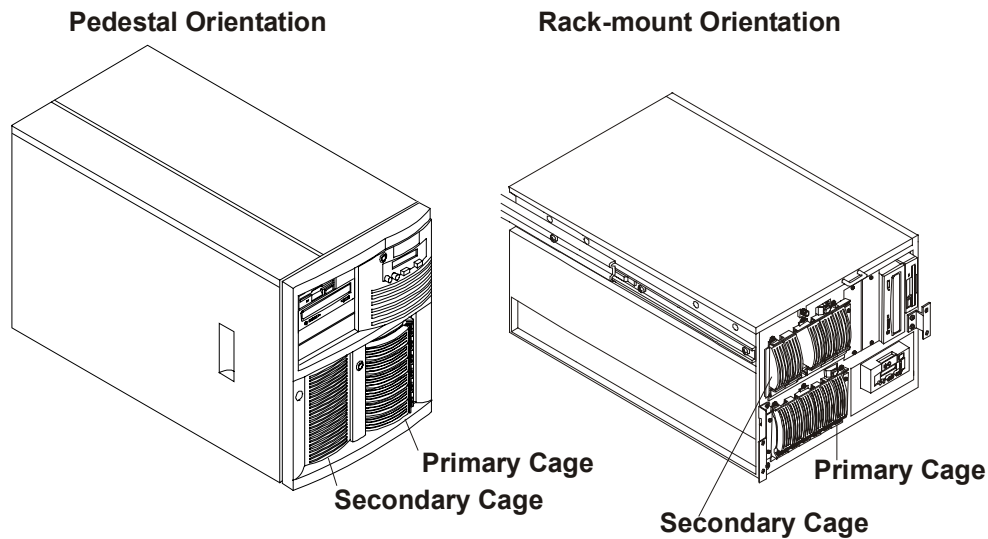
**CAUTION** Do not rock the DIMM into place, but apply firm and even pressure. If a gap exists between the retaining latches and the DIMM, remove and replace the module until no gap exists.



### Installing a DIMM

5. If all DIMMs have been installed, replace the cover.
6. If the NetServer is a rack installation, return the chassis into the rack.
7. Re-install the bezel onto the front of the HP NetServer.
8. Reconnect the power cord(s).
9. Power on the HP NetServer according to the respective NOS power up instructions.
10. Return the HP NetServer to normal operation.

## Replacing the Hot-Swap Cage



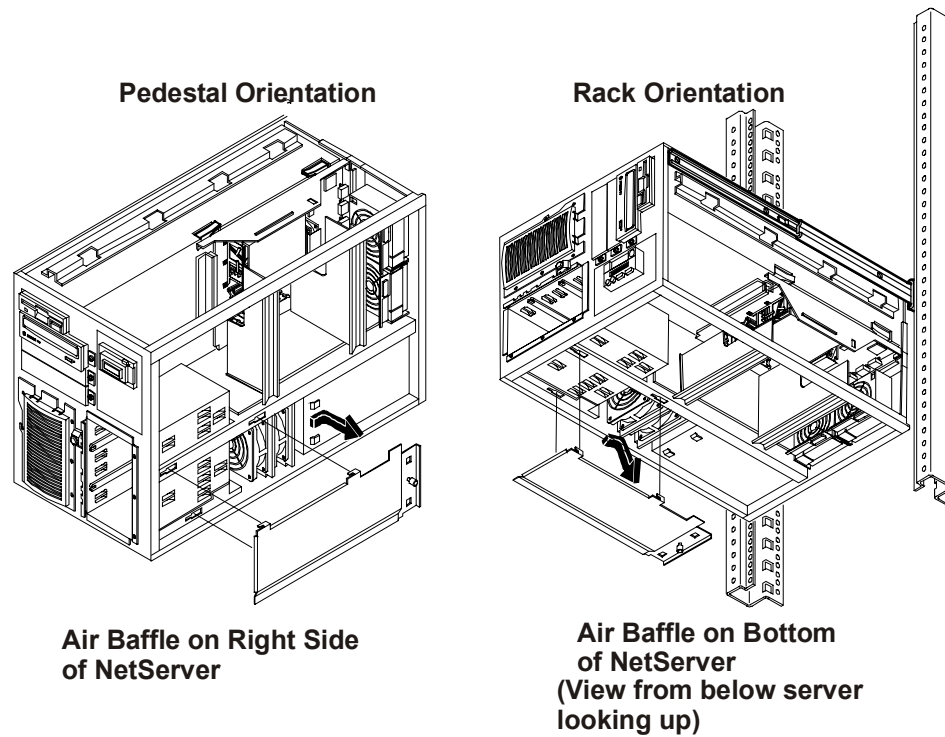
### Primary and Secondary Cages

Follow these instructions to remove the primary cage:

1. Allow time for your hot-swap disk drives to spin down, then remove all hard disk drives from the mass storage cage where you will install the duplex board.

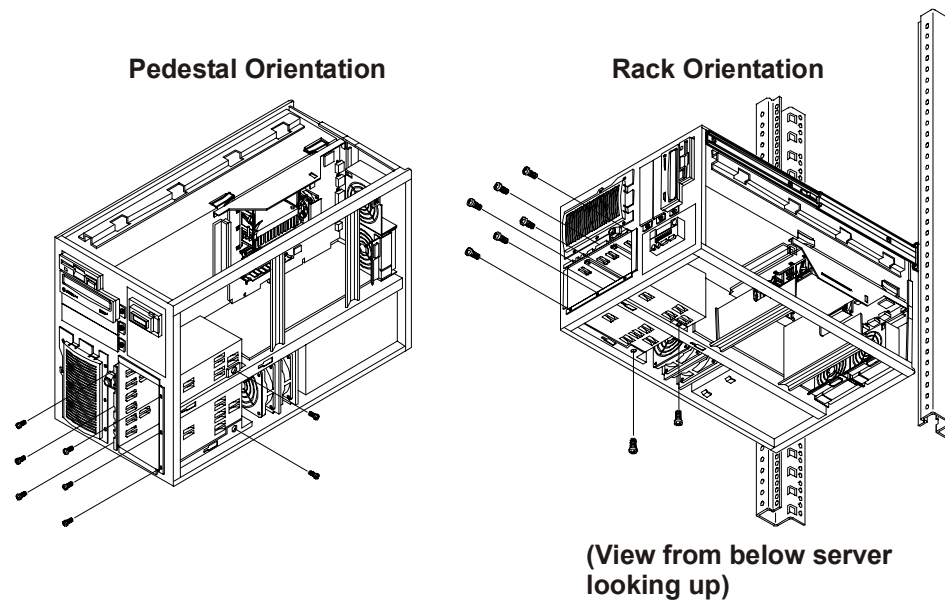
<b>CAUTION</b>	Do not remove hot-swap disk drives until they have had time to spin down.
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2. Remove the front bezel.
3. Remove Covers 1 and 3 as follows
  - a. If your NetServer is in the pedestal orientation, remove both the right cover and the left cover.
  - b. If your NetServer is in the rack-mounted orientation, extend the rack's anti-tip foot or ensure that the anti-tip feature is installed. Then pull the NetServer forward to extend it on the rack rails, and then remove both the bottom cover and the top cover.
4. Remove the air baffle by loosening the thumbscrew, sliding the air baffle toward the back of the NetServer, and lifting it away from the chassis



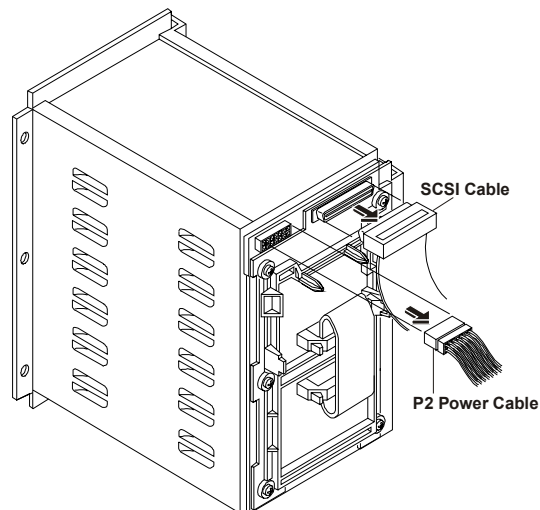
#### Remove Air Baffle

5. Remove eight screws that hold the primary mass storage cage in place.



#### Remove Eight Screws on Primary Mass Storage Cage

6. Disconnect the SCSI and the P2 power cables.



#### Disconnect SCSI and P2 Power Cables

7. Slide out the primary mass storage cage.

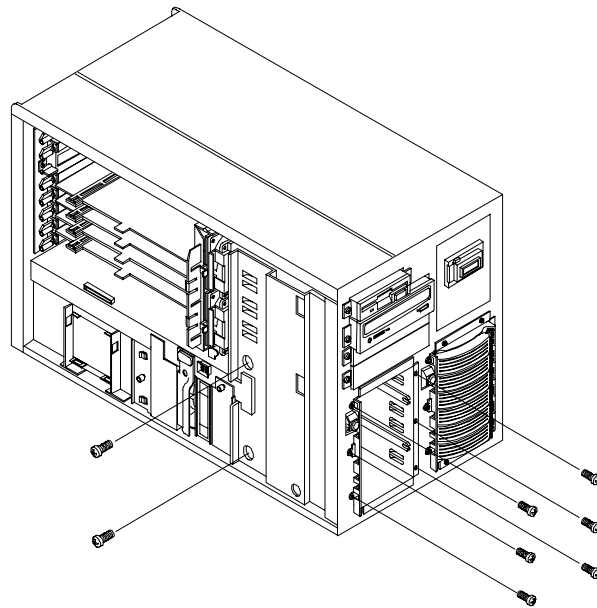
#### Removing the Secondary Cage

Follow these instructions to remove the secondary cage:

1. Allow time for your hot-swap disk drives to spin down, then remove all hard disk drives from the mass storage cage where you will install the duplex board.

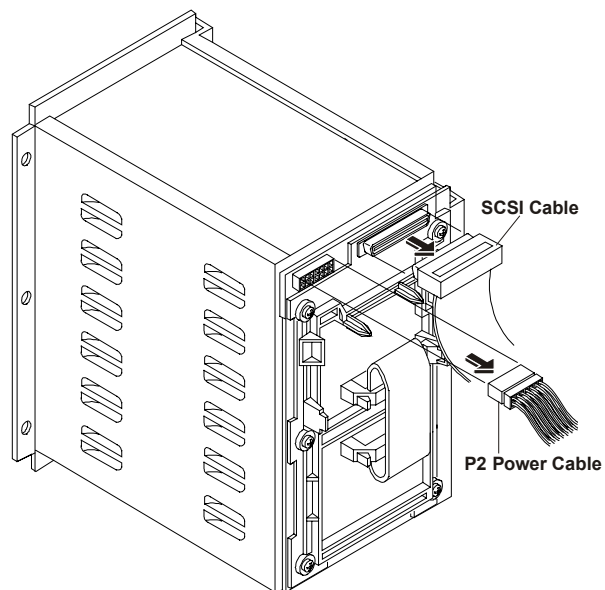
<b>CAUTION</b>	Do not remove hot-swap disk drives until they have had time to spin down.
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2. Remove the front bezel.
3. Remove Cover 1 as follows
  - a. If your NetServer is in the pedestal orientation, remove the left cover.
  - b. If your NetServer is in the rack-mounted orientation, extend the rack's anti-tip foot or ensure that the anti-tip feature is installed. Then pull the NetServer forward to extend it on the rack rails, and then remove the top cover.
4. Remove eight screws that hold the secondary mass storage cage in place.



### Remove Eight Screws on Secondary Mass Storage Cage

5. Remove the SCSI and P2 power cables



### Disconnect SCSI and P2 Power Cables

6. Slide out the mass storage cage.

## Replacing the Duplex SCSI Board

The Duplex SCSI Board mounts on the back of the hot-swap card cage and serves the purpose of splitting it into two SCSI channels.

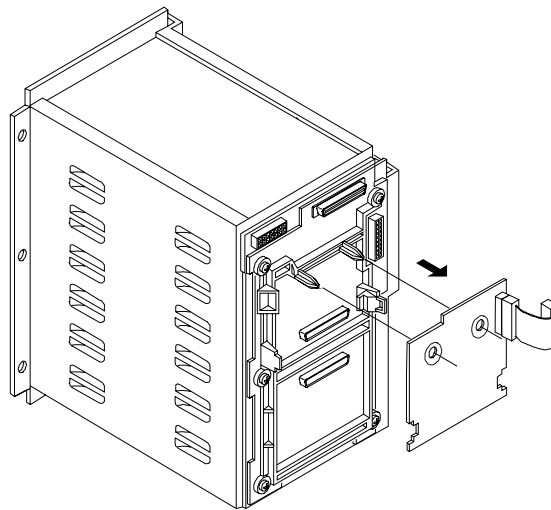
1. Log off all users. Back up files. Follow instructions in your network operating system (NOS) documentation to gracefully shut down all networking software and applications.
2. Press the power switch on the HP NetServer's control panel when prompted by the operating system.
3. Disconnect the power cables.

**WARNING** The power supplies will continue to provide standby current to the NetServer until the power cable is disconnected.

4. If you have a rack-mounted LH3000r, then consider removing the signal cables from the rear of the enclosure before extending the enclosure on the slides (if you don't have a cable management arm). If necessary, label the signal cables to support re-connecting them.
5. Remove the top cover (rack-mount orientation) or the side cover (pedestal version).

**CAUTION** Wear a wrist strap and use a static-dissipating work surface connected to the chassis when handling components. Ensure that the metal of the wrist strap contacts your skin.

6. Follow the steps described in "**Replacing the Hot-Swap Drive Cage**".
7. Remove the Duplex SCSI Board.



**Duplex SCSI Board Removal/ Replacement**

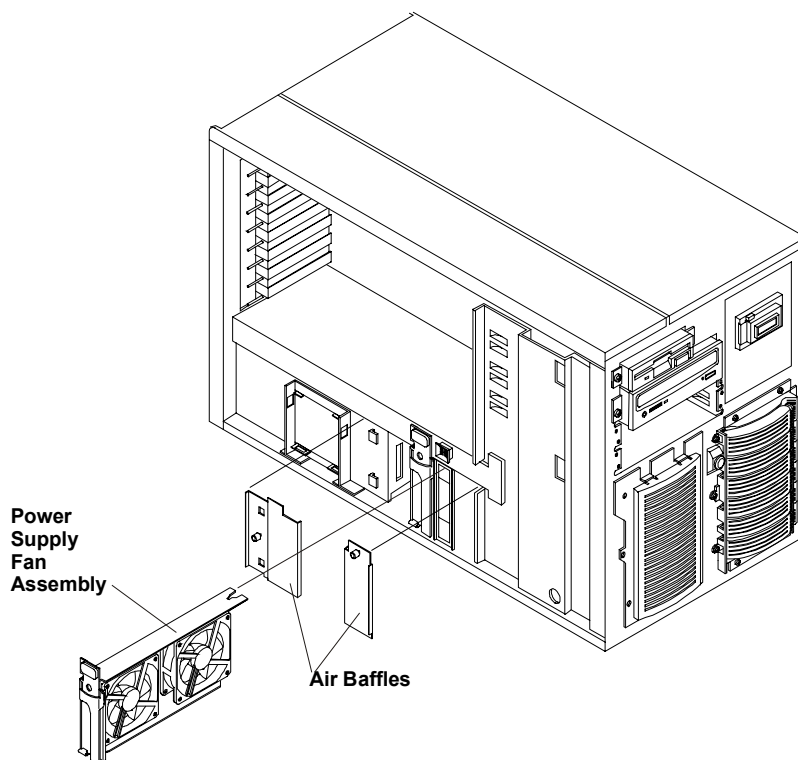
### Replacing the Duplex SCSI Board

Reverse the steps described above and resume operations.



## Replacing Power Supply Fans

The power supply fans may be hot swapped. Note that the air baffles adjacent to them must be properly seated to allow the side panel to go back on.



## Replacing the Flexible Disk Drive

Replace the flexible disk drive only after you have verified that it is failing with **DiagTools**. POST error codes suggesting flexible disk drive problems are usually caused by problems on the system board.

### NOTE

You may run into a case where a flexible disk drive passes DiagTools but files written to it will not be readable by other floppies to do mechanical misalignment.

1. Log off all users. Back up files. Follow instructions in your network operating system (NOS) documentation to gracefully shut down all networking software and applications.
2. Press the power switch on the HP NetServer's control panel when prompted by the operating system.
3. Disconnect the power cables.

### WARNING

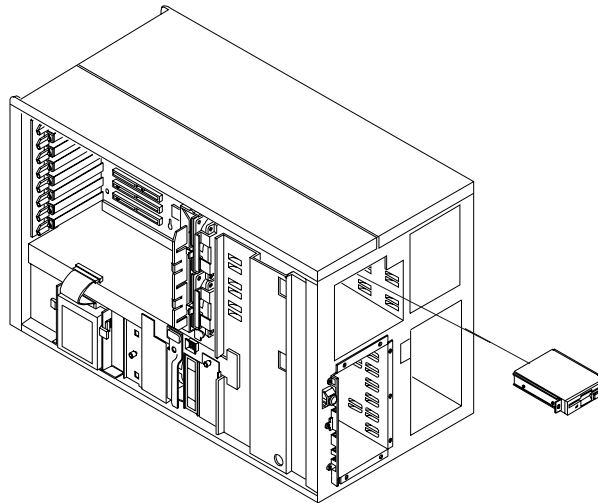
The power supplies will continue to provide standby current to the NetServer until the power cable is disconnected.

4. If you have a rack-mounted LH 3000r, then consider removing the signal cables from the rear of the enclosure before extending the enclosure on the slides (if you don't have a cable management arm). If necessary, label the signal cables to support re-connecting them.
5. Remove the top cover (rack-mount orientation) or the side cover (pedestal version).

**CAUTION**

Wear a wrist strap and use a static-dissipating work surface connected to the chassis when handling components. Ensure that the metal of the wrist strap contacts your skin.

6. Remove the bezel. If necessary, temporarily remove the I/O fans.
7. Disconnect the signal cable (ribbon cable) and the power cable from the rear of the flexible disk drive.
8. Use the T-15 driver to remove the two screws holding the flexible disk drive to the front of the chassis.

**Flexible Disk Drive Removal**

9. Slide the drive forward and out of the chassis.
10. Move the mounting brackets from the replacement drive to the flexible disk drive and reverse the above procedure.

**NOTE**

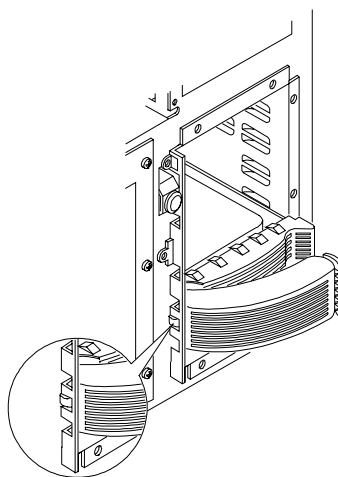
The flexible disk drive connectors are keyed. Make sure they are fully seated.

## Replacing Hot-Swap Drive

**CAUTION**

*You must remove the drive slowly to ensure the drive heads are parked prior to removal. Follow these instructions to prevent handling damage, such as head slaps or head actuator unlocking.*

1. To unlock the drive, push the locking latch in and then pull the ejector handle toward you.



#### Locking Tab Location

2. Gently pull the drive out about an inch to disengage the power connection.
3. Wait about 30 seconds for the drive to stop spinning and the drive heads to park.
4. Use your hand to support the bottom of the drive, while you slowly pull the drive straight out.  
Do not allow the drive to fall.
5. Place the drive in an electrostatic-protected container. Do not stack drives.

## Replacing the I/O Board

### NOTE

You may wish to use the Navigator CD to print or save configuration data stored on the current system board (in NVRAM) before you swap out the System Board.

1. Log off all users. Back up files. Follow instructions in your network operating system (NOS) documentation to gracefully shut down all networking software and applications.
2. Press the power switch on the HP NetServer's control panel when prompted by the operating system.
3. Disconnect the power cables.

### WARNING

The power supplies will continue to provide standby current to the NetServer until the power cable is disconnected.

4. If you have a rack-mounted LH 3000r, then consider removing the signal cables from the rear of the enclosure before extending the enclosure on the slides (if you don't have a cable management arm). If necessary, label the signal cables to support re-connecting them.
5. Remove the top cover (rack-mount orientation) or the left cover (pedestal version).

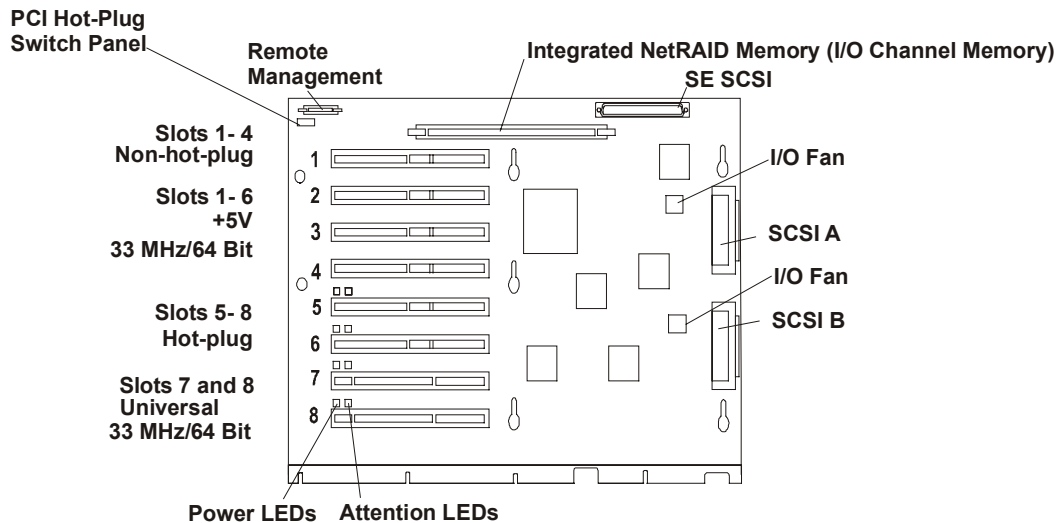
### CAUTION

Wear a wrist strap and use a static-dissipating work surface connected to the chassis when handling components. Ensure that the metal of the wrist strap contacts your skin.

## 6.Remove:

- PCI Cards
- I/O Fans
- PCI slot dividers
- PCI card guide

## 7. Disconnect power and signal cables from the I/O board.



- Loosen the three screws along the edge of I/O board at the rear of the enclosure.
- Use the extractor insertion levers at the upper corners of the I/O board to lever it out of the card edge connector at the Power Management and Interconnection board.
- 10.Lift the I/O board up and out of the chassis.

**NOTE**

Take note of the switch and jumper settings on the board being removed and duplicate these on the replacement board.

- Put the replacement board in the chassis with the screw holes and holders properly placed.
- Use the insertion/extraction levers to push the board down into the card edge connector.
- Use the T15 driver to screw in the three screws holding the I/O board to the chassis.
- Reconnect the cables to the I/O board.
- Install the hardware subsystems listed in step 6 above.
- .Re-assemble the covers and start up the system.

**NOTE**

You may wish to use the replicate function on the Navigator CD ROM to re-configure your NetServer.

## Replacing I/O Fans

The I/O fans may be hot swapped and do not require any tools to perform the replacement.

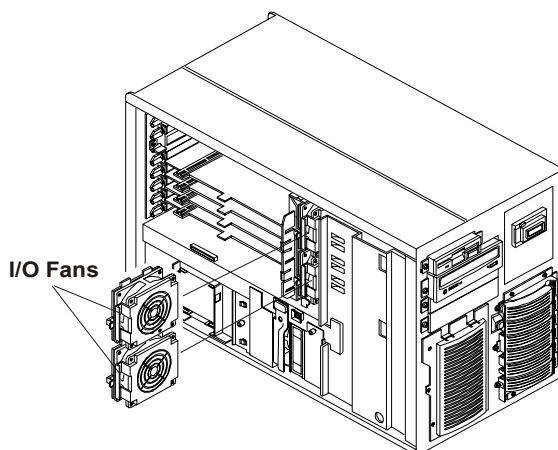
1. Log off all users. Back up files. Follow instructions in your network operating system (NOS) documentation to gracefully shut down all networking software and applications.
2. Press the power switch on the HP NetServer's control panel when prompted by the operating system.
3. Disconnect the power cables.

<b>WARNING</b>	The power supplies will continue to provide standby current to the NetServer until the power cable is disconnected.
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4. If you have a rack-mounted LH3000r, then consider removing the signal cables from the rear of the enclosure before extending the enclosure on the slides (if you don't have a cable management arm). If necessary, label the signal cables to support re-connecting them.
5. Remove the top cover (rack-mount orientation) or the side cover (pedestal version).

<b>CAUTION</b>	Wear a wrist strap and use a static-dissipating work surface connected to the chassis when handling components. Ensure that the metal of the wrist strap contacts your skin.
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6. The individual I/O fans may be removed by pressing the release tab and pulling the fan away from the chassis.
7. The individual I/O fan must be replaced for proper operation of the NetServer.



## Replacing the Power Management/Interconnect Board

You will remove the LH 3000/ LH 3000r Power Management/Interconnect board only when it has failed.

1. Log off all users. Back up files. Follow instructions in your network operating system (NOS) documentation to gracefully shut down all networking software and applications.
2. Press the power switch on the HP NetServer's control panel when prompted by the operating system.

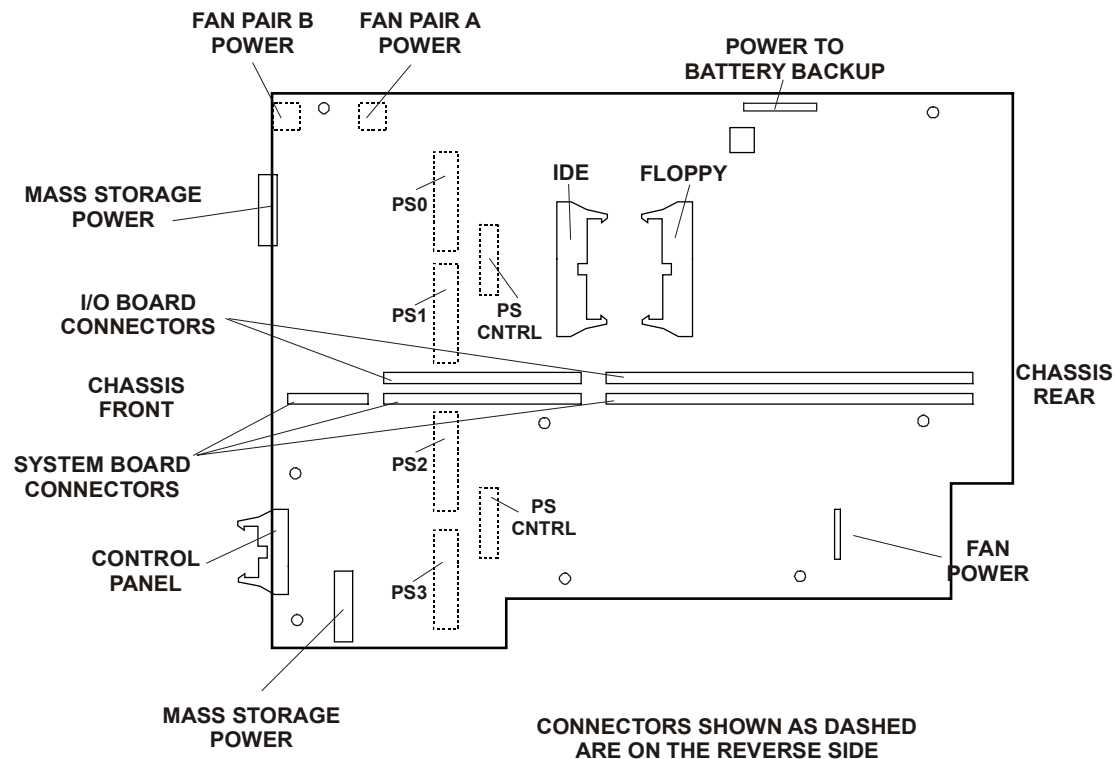
3. Disconnect the power cables.

**WARNING** The power supplies will continue to provide standby current to the NetServer until the power cable is disconnected.

4. If you have a rack-mounted LH 3000r, consider removing the signal cables from the rear of the enclosure before extending the enclosure on the slides (if you don't have a cable management arm). If necessary, label the signal cables to support re-connecting them.
5. Remove the top and bottom covers (rack-mount orientation) or the left and right covers (pedestal version).

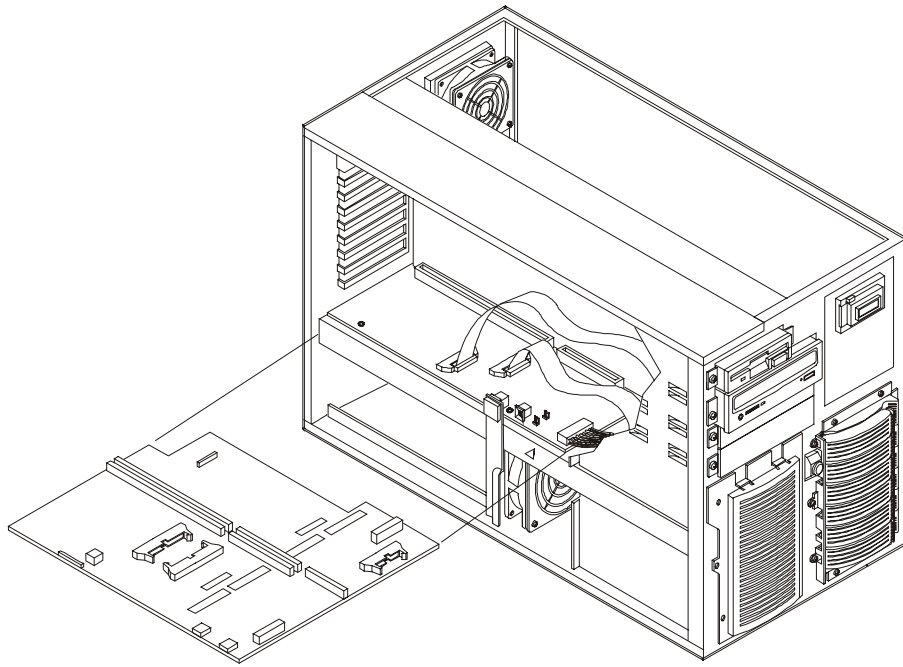
**CAUTION** Wear a wrist strap and use a static-dissipating work surface connected to the chassis when handling components. Ensure that the metal of the wrist strap contacts your skin.

6. Remove hardware components to gain access to the Power Management/Interconnect board:
  - System board
  - I/O board
7. Disconnect power and signal cables from the Power Management/Interconnect board.

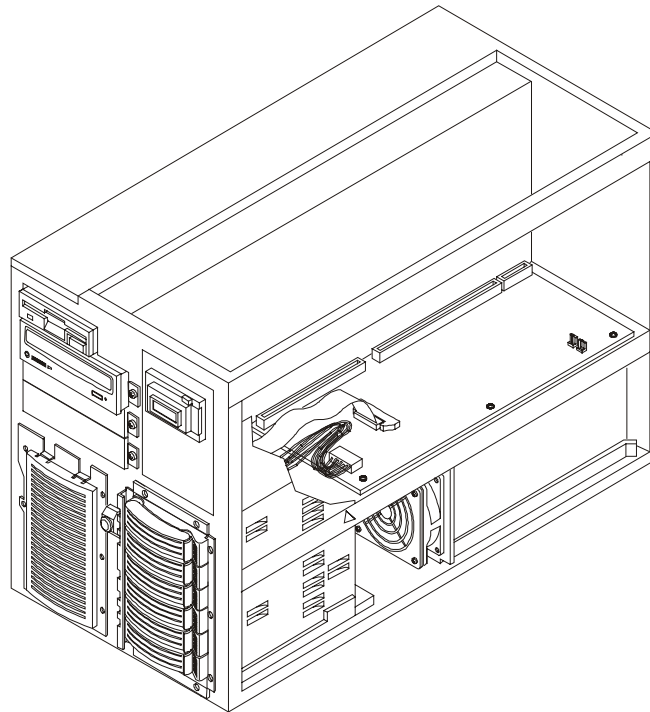


#### Power Management/Interconnect Board Connectors

8. Remove the eight screws from the Power Management/Interconnect board.



**Power Management/Interconnection Board Access – Left Side/Top**



**Power Management/Interconnection Board Access – Right Side/Bottom**

9. Slide the Power Management/Interconnect board out of the chassis.

### **Replacing the Power Management/Interconnect Board**

1. Reverse steps 6 - 9 above.
2. Reconnect the cables to the Power Management/Interconnect board.

3. Install the hardware components listed in step 6 above.
4. Re-assemble the covers and start up the system.

## Replacing HP NetRAID DIMM

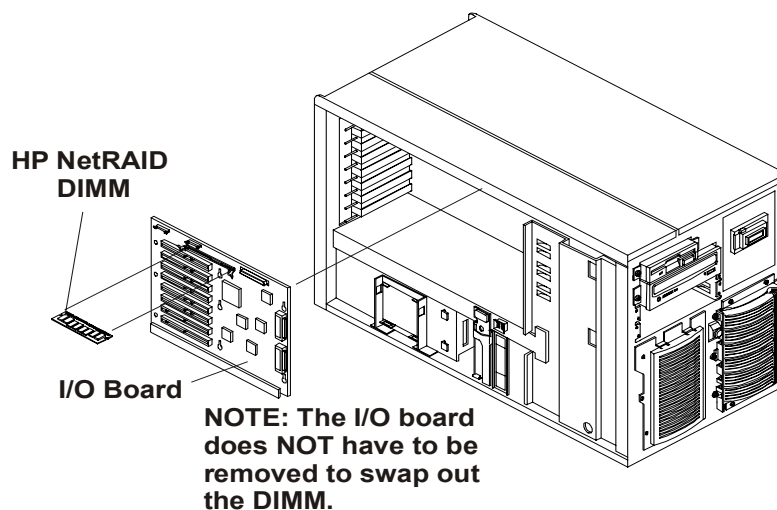
1. Log off all users. Back up files. Follow instructions in your network operating system (NOS) documentation to gracefully shut down all networking software and applications.
2. Press the power switch on the HP NetServer's control panel when prompted by the operating system.
3. Disconnect the power cables.

**WARNING** The power supplies will continue to provide standby current to the NetServer until the power cable is disconnected.

4. If you have a rack-mounted LH 3000r, then consider removing the signal cables from the rear of the enclosure before extending the enclosure on the slides (if you don't have a cable management arm). If necessary, label the signal cables to support re-connecting them.
5. Remove the top cover (rack-mount orientation) or the left side cover (pedestal version).

**CAUTION** Wear a wrist strap and use a static-dissipating work surface connected to the chassis when handling components. Ensure that the metal of the wrist strap contacts your skin.

6. Locate and remove the DIMM from the I/O board.



**Remove the HP NetRAID DIMM from the I/O Board**

7. Replace the DIMM and reassemble the system.



## Replacing Non-Hot-Swap Drive

Replace an optional non-hot-swap drive only after you have verified that it is failing with DiagTools. POST error codes suggesting floppy disk drive problems are usually caused by problems on the system board.

**NOTE**

You may run into a case where a floppy disk drive passes DiagTools but files written to it will not be readable by other floppies to do mechanical misalignment.

1. Log off all users. Back up files. Follow instructions in your network operating system (NOS) documentation to gracefully shut down all networking software and applications.
2. Press the power switch on the HP NetServer's control panel when prompted by the operating system.
3. Disconnect the power cables.

**WARNING**

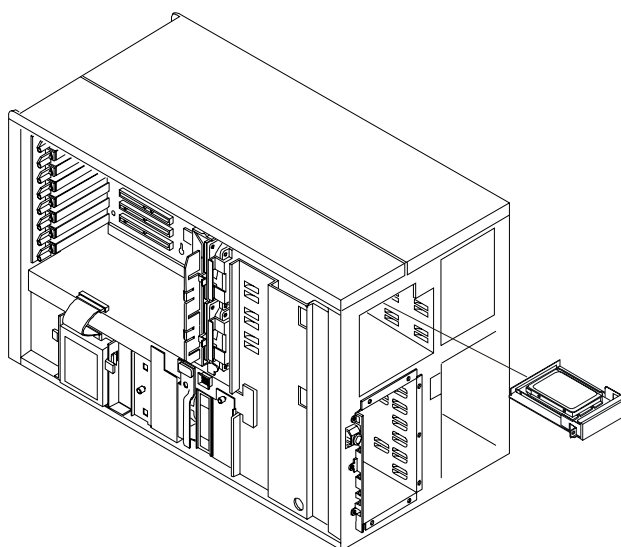
The power supplies will continue to provide standby current to the NetServer until the power cable is disconnected.

4. If you have a rack-mounted LH 3000r, then consider removing the signal cables from the rear of the enclosure before extending the enclosure on the slides (if you don't have a cable management arm). If necessary, label the signal cables to support re-connecting them.
5. Remove the top cover (rack-mount orientation) or the side cover (pedestal version).

**CAUTION**

Wear a wrist strap and use a static-dissipating work surface connected to the chassis when handling components. Ensure that the metal of the wrist strap contacts your skin.

6. Remove the bezel. If necessary, temporarily remove the I/O fans.
7. Disconnect the signal cable (ribbon cable) and the power cable from the rear of the hard disk.
8. Use the T-15 driver to remove the two screws holding the drive tray to the front of the chassis.



**Non-Hot-Swap Drive Removal**

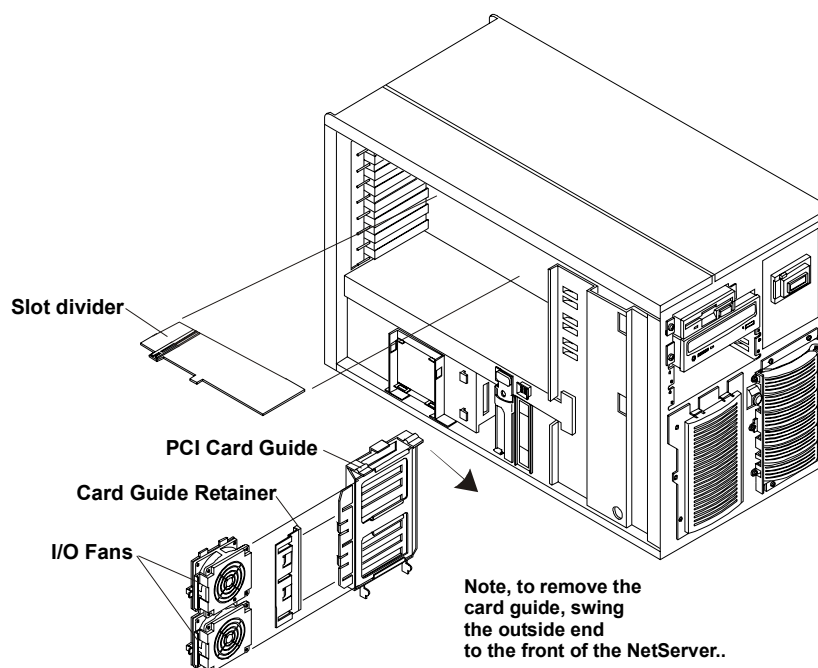
9. Slide the optional non-hot-swap drive forward and out of the chassis.
10. Move the mounting brackets from the non-hot-swap drive to the floppy disk drive and reverse the above procedure.

**NOTE**

The drive connectors are keyed. Make sure they are fully seated.

## Replacing the PCI Card Guide

To remove the card guide, you may first have to remove all PCI cards, slot dividers, the I/O fans, and the card guide retainer. See following illustration. The PCI card guide snaps out of the chassis by swinging forward at the outside end. See following illustration.



## Replacing PCI Boards

The LH 3000 and 3000r NetServers support up to 8 PCI boards. Four of these boards may be of the Hot Swap type and can be replaced while the system is operating. Removing the left side cover (pedestal version) or top cover (rack version) can access all boards.

### Hot Adding or Replacing Hot-Plug PCI Boards

The PCI Hot-Plug option is NOS-dependent. To use the Hot-Plug option, the PCI board must have a hot-plug compliant driver and a Hot-Plug Utility for the respective NOS. The Hot-Plug Utility is used to turn power off/on to the PCI slot, while the HP NetServer continues to operate normally. Refer to the PCI Hot-Plug Replacement procedures in Information Assistant for the NOS you are using.

**NOTE**

Although the replacement PCI board has the same part number as the card being removed, it may require a driver update. Check with the manufacturer of the PCI card.

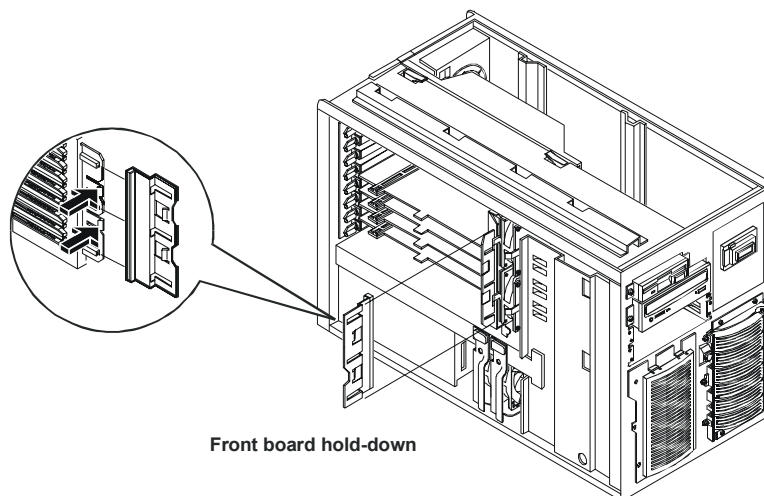
1. Log off all users. Back up files. Follow instructions in your network operating system (NOS) documentation to gracefully shut down all networking software and applications.
2. Press the power switch on the HP NetServer's control panel when prompted by the operating system.
3. Disconnect the power cables.

**WARNING** The power supplies will continue to provide standby current to the NetServer until the power cable is disconnected.

4. If you have a rack-mounted LH 3000r, then consider removing the signal cables from the rear of the enclosure before extending the enclosure on the slides (if you don't have a cable management arm). If necessary, label the signal cables to support re-connecting them.
5. Remove the top cover (rack-mount orientation) or the side cover (pedestal version).

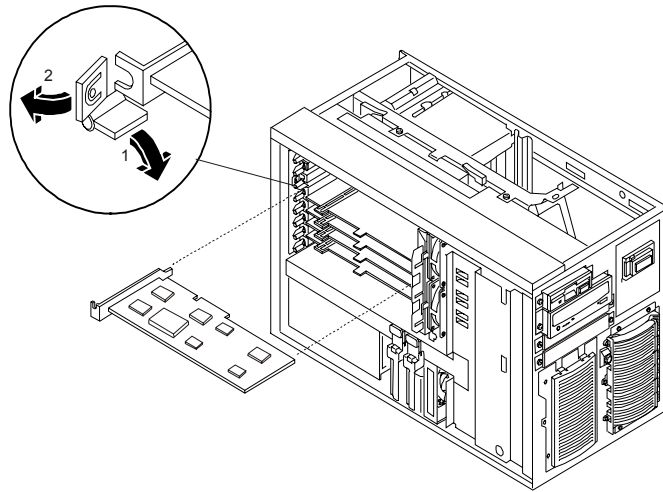
**CAUTION** Wear a wrist strap and use a static-dissipating work surface connected to the chassis when handling components. Ensure the metal of the wrist strap contacts your skin.

6. Remove any cables connected to the rear panel of the PCI board.
7. Remove the front board hold down if necessary to remove full-length PCI boards.



#### Removing the Front Board Hold Down

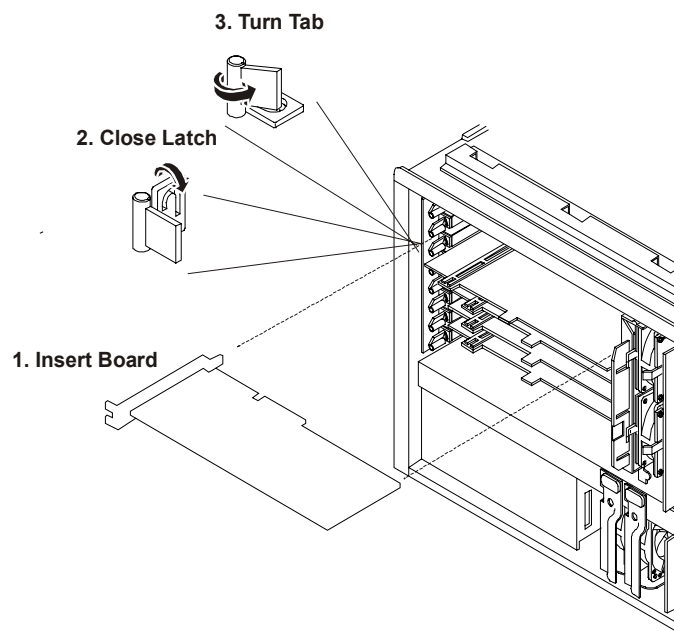
8. Open the latch holding the PCI board in place.



9. Lift the PCI board out of the socket.

### Replacing Non Hot Swap PCI Boards

Reverse the steps 6-8 described above. Then re-assemble the system and resume operations.



### Installing the Accessory Board

---

**NOTE**

It may be necessary to re-load the software drivers for the PCI board that has been swapped.

---

## Replacing the PCI Hot-Plug Assembly

Use this topic to replace the Hot-Plug Assembly located at the rear surface of the chassis. The same Hot-Plug Assembly is used in both models of the HP NetServers (LH3000/LH3000r). The NetServer should be shut down before removing PCI latch hardware.

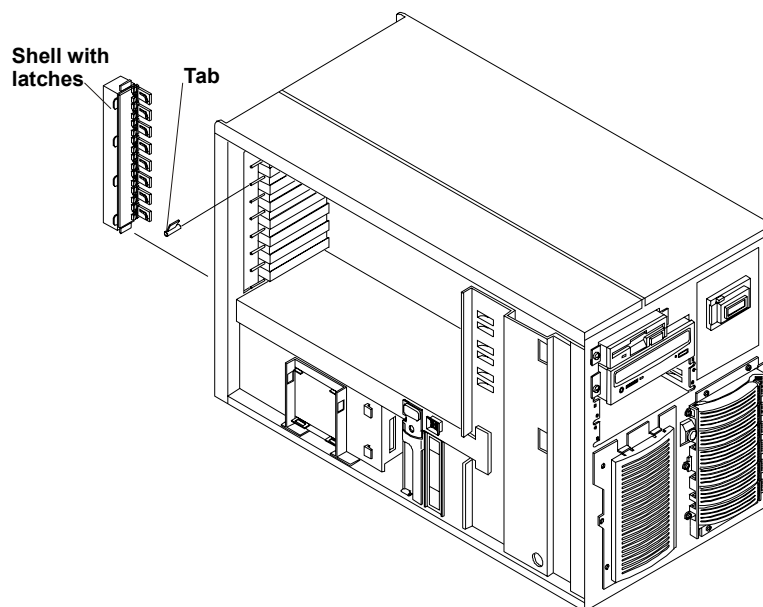
The plastic latch (8), which holds the PCA in place, is hinge mounted on a molded plastic frame and the plastic frame is inserted into metal shell secured to the rear of the chassis with four (4) screws. The blue plastic tabs are individual mounted on metal posts that remain in the chassis.

1. Log off all users and if necessary back-up files.
2. Follow instructions in your network operating system (NOS) documentation to gracefully shut down all networking software and applications.
3. Press the power switch on the HP NetServer's control panel when prompted by the operating system.
4. Disconnect the power cables.

**WARNING**

The power supplies will continue to provide standby current to the NetServer until the power cord(s) is/are disconnected.

5. Remove the left (or top) cover to access the inside of the chassis by referring to:
6. Disconnect the Hot-Plug Assembly connector on the I/O board.
7. Open all eight tabs to release the Hot-Plug Assembly.
8. Remove the two screws underneath the Hot-Plug Assembly, using a T-15 Torx driver.
9. Remove the two screws at the rear of the Hot-Plug Assembly, using a T-15 Torx driver.
10. Pull the Hot-Plug Assembly out of the NetServer.

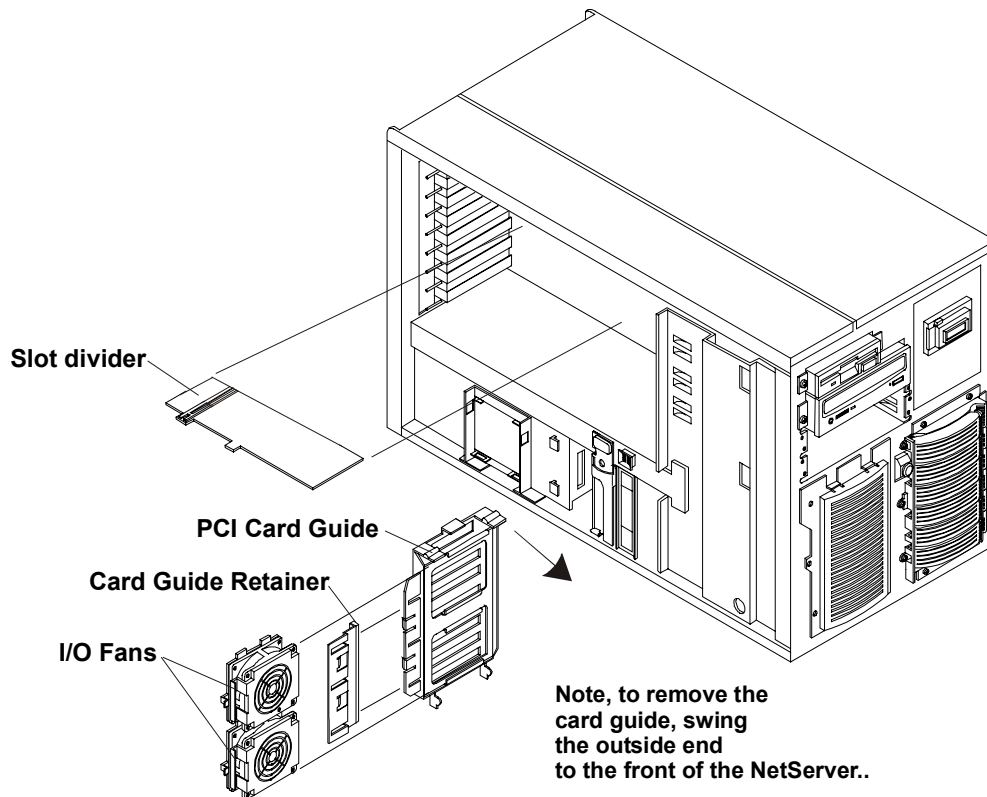


### Hot-Plug Assembly Latch and Tab Hardware

11. To remove the individual blue tab, remove the respective screw for the desired blue tab.
12. To install the Hot-Plug Assembly and the blue tabs, reverse Steps.

## Replacing PCI Slot Dividers

The PCI slot dividers simply snap in and out of plastic mounting fixtures on the I/O board. However, you may have to remove the PCI card guide to get a replacement slot divider into the chassis. Refer to the following figure.



## Replacing the Power Supplies

Check the power supply status LEDs before removing and replacing the supply.

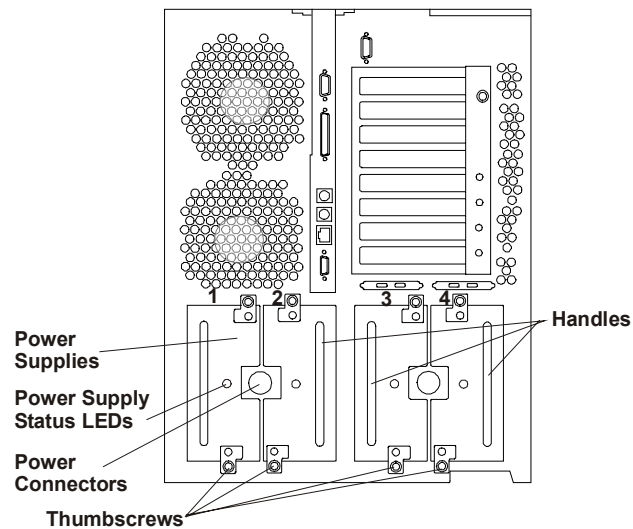
**CAUTION**

If a power supply bay is not in use; be sure to keep the cover on it. If you do not, system ventilation and EMI (electro-magnetic interference) suppression may be affected.

1. Locate the power supply to be removed.

**NOTE**

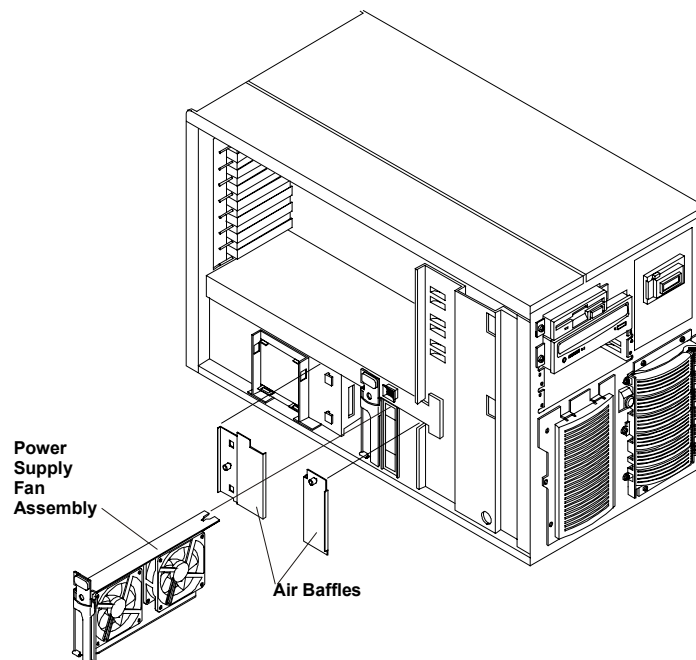
If the NetServer is powered on and the status LED for a seated supply is off, you may infer that the supply has failed. However, when the NetServer is in standby (plugged in but powered-down; front panel LCD is ON), the power supply status LEDs will be OFF.

**LH 3000 Power Supply Location**

2. Remove the AC power cable from the inlet on the supply.
3. Grasp the handle on the power supply.
4. Pull the power supply out of the NetServer chassis.
5. Slide the replacement power supply into the chassis.
6. Once the power supply is seated in the chassis, use a T15 driver to tighten the thumbscrews.
7. Check the status LED.

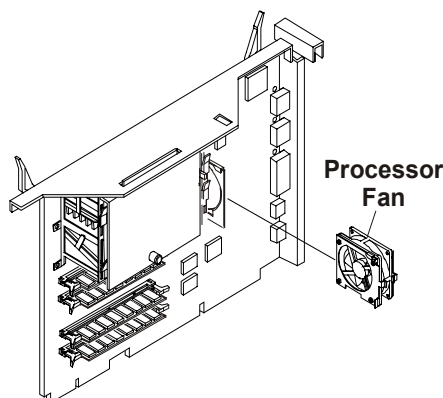
## Replacing Power Supply Fans

The power supply fans may be hot swapped. Note that the air baffles adjacent to them must be properly seated to allow the side panel to go back on.



## Replacing the Processor Fan

The processor fan is not hot swappable. To access it, remove the system board. Refer to the following figure.



## Replacing Processors

**CAUTION**

Do not remove the processor from its bag until you are ready to install it. Make sure the bag remains sealed. Before you remove a processor from the anti-static container, touch a grounded, unpainted metal surface on the HP NetServer to discharge static electricity.

For information on processor configuration guidelines, refer to processor configuration guidelines above.

Before opening up the NetServer:

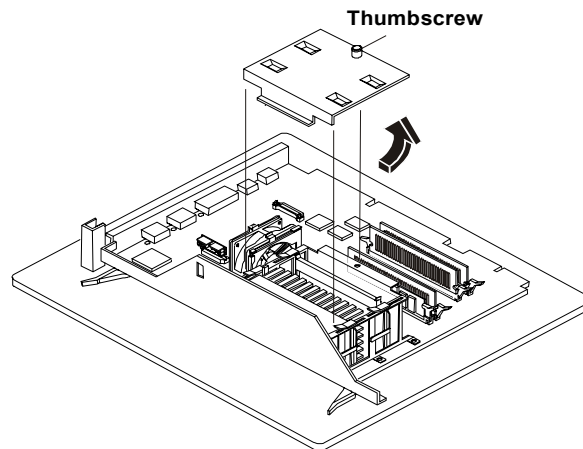
1. Log off all users. Back up files. Follow instructions in your network operating system (NOS) documentation to gracefully shut down all networking software and applications.
2. Press the power switch on the HP NetServer's control panel when prompted by the operating system.
3. Disconnect the power cables.

**WARNING**

The power supplies will continue to provide standby current to the NetServer until the power cable is disconnected.

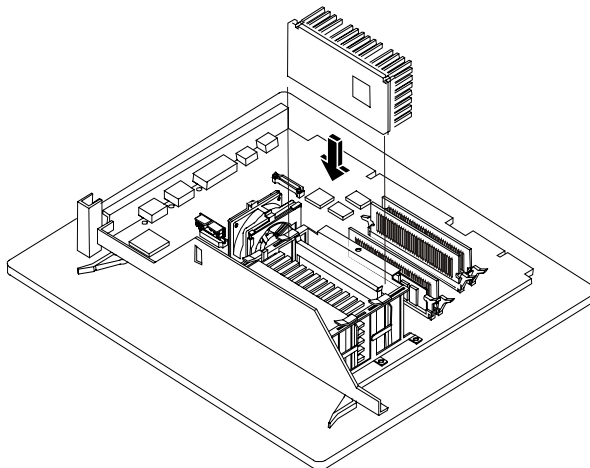
4. If you have a rack-mounted LH3000r, then consider removing the signal cables from the rear of the enclosure before extending the enclosure on the slides (if you don't have a cable management arm). If necessary, label the signal cables to support re-connecting them.
5. Slide the system board assembly from the chassis and place it metal plate side down on an anti-static pad.
6. Remove the processor cage cover by releasing the thumbscrew. Set the cover aside.





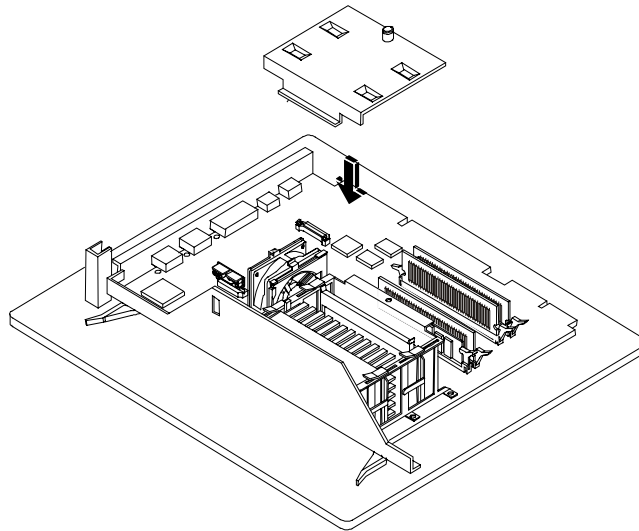
#### Remove Processor Cage Cover

7. Slide the blue plastic release levers forward to free the failed processor.



#### Install Processor

8. Remove the processor from the sealed bag.
9. Align the additional processor over the secondary slot so that the heat sink faces towards the center of the enclosure like the processor already installed.
10. Gently push down on the additional processor until the blue latches return to their closed position.
11. Replace the processor cage cover.

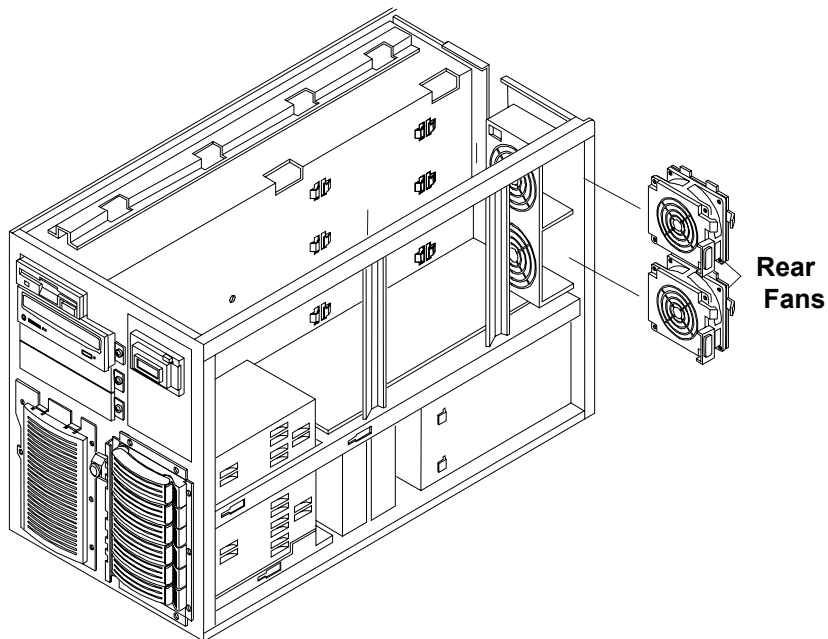


#### **Replace Processor Cage Cover**

12. If you removed the system board assembly, re-install the assembly now.

## Replacing Rear Fans

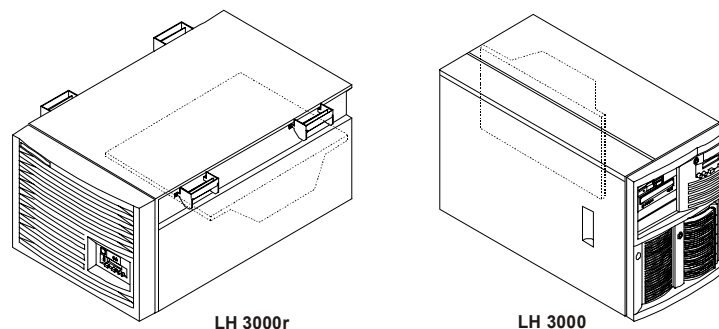
The rear fans may be hot-swapped. Remove the side panel to access the fans.



## Replacing the System Board

**CAUTION** Extend the anti-tip foot prior to any work on a rack-mount server. The power supplies will continue to provide standby current to the NetServer until the power cable is disconnected.

1. Log off all users and gracefully shut down the network operating system according to directions in your NOS documentation.
2. Power down the HP NetServer.
3. Disconnect the power cord and signal cables, and if necessary, label each one to support re-assembly.
4. Remove the covers.



Location of System Board Assembly

**WARNING**

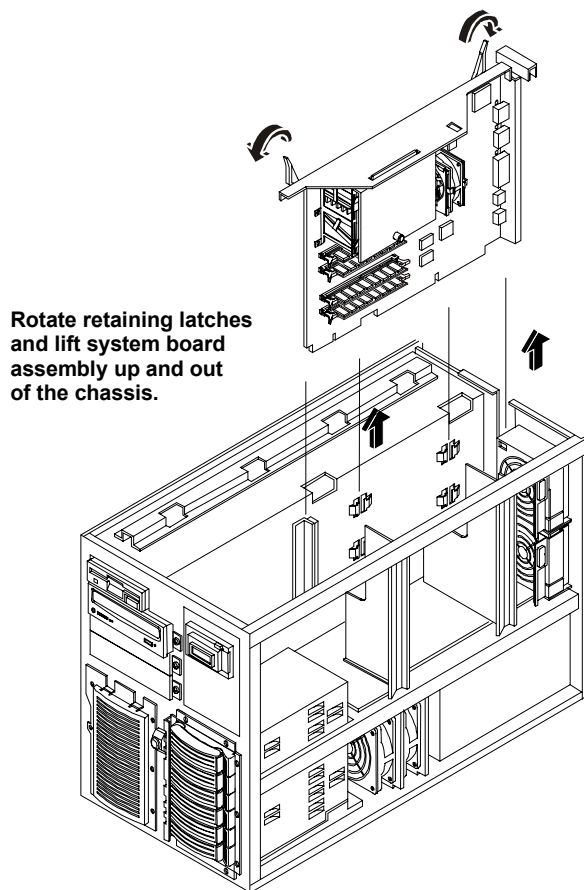
Always disconnect the power cord before removing the covers, to avoid exposure to high energy levels that may cause burns when parts are short-circuited by metal objects such as tools or jewelry. Disconnect any telephone cables to avoid exposure to shock hazard from telephone ringing voltages.

5. Unlatch the blue retaining latches to release the system board assembly.

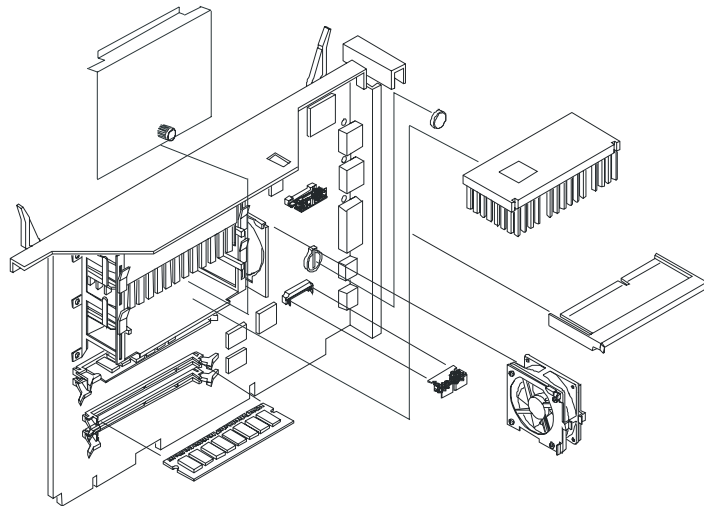
**CAUTION**

The system board assembly weighs approximately 15 lbs. Have someone help you. One person can do it, but it is easier with two.

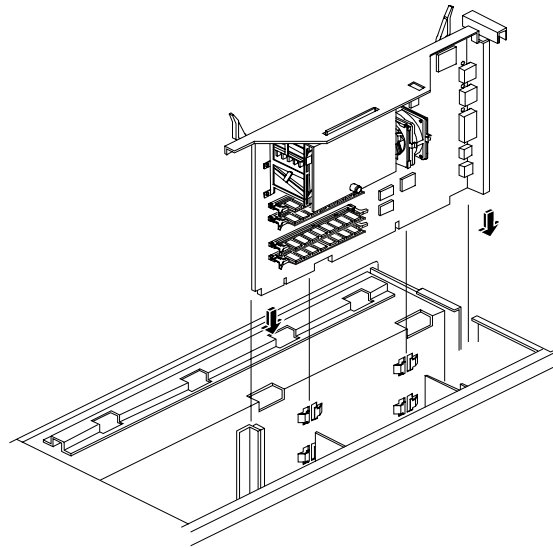
6. Pull the board out until it clears the chassis.

**Removing the System Board Assembly**

7. Slide the system board assembly from the chassis and place it metal plate side down on an anti-static pad.
8. Remove all components from the old system board.



9. Install all components on the new system board.
10. Install the system board assembly in the chassis.



#### Install the System Board Assembly

**CAUTION**

Do not operate the HP NetServer for more than sixty minutes without first installing all covers and the front bezel. Operating the system without all covers in place reduces critical cooling airflow over some components, such as hard disk drives and processors. Operating the system without all covers in place may result in failure of these components.

11. Replace the covers and bezel.
12. Reconnect the power cords and signal cables.
13. Return the NetServer to normal operation.
14. Reset the system time and date if necessary.

## Replacing a VRM

You may choose to swap out a VRM (voltage regulator module) in the process of troubleshooting processor problems.

1. If the HP NetServer is operating, log off all users and if necessary back-up files.
2. Follow instructions in your network operating system (NOS) documentation to gracefully shut down all networking software and applications.
3. Press the power switch on the HP NetServer's control panel when prompted by the operating system.

Normally, this completes the power down procedure.

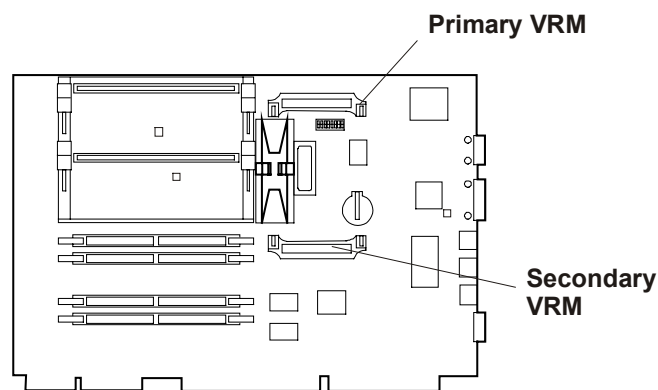
4. Disconnect the power cord from its power source.

**WARNING** The power supplies will continue to provide standby current to the NetServer until the power cable is disconnected.

5. Gain access to the respective model of the HP NetServer by referring to "**Replacing the Bezel and Replacing the Covers**".
6. Remove the top cover (rack-mount) or the right side cover (pedestal) along with the left hand cover (rack-mount) or top (pedestal).

**CAUTION** Wear a wrist strap and use a static-dissipating work surface connected to the chassis when handling components. Ensure that the metal of the wrist strap contacts your skin.

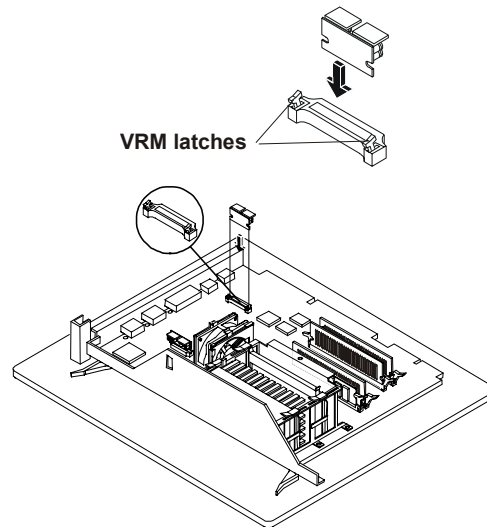
7. Slide the system board assembly from the chassis and place its metal plate side down on an anti-static pad.
8. Identify the VRM location as primary or secondary.



**VRM Locations**

9. Pull the connector latches to the side and lift the VRM upwards.

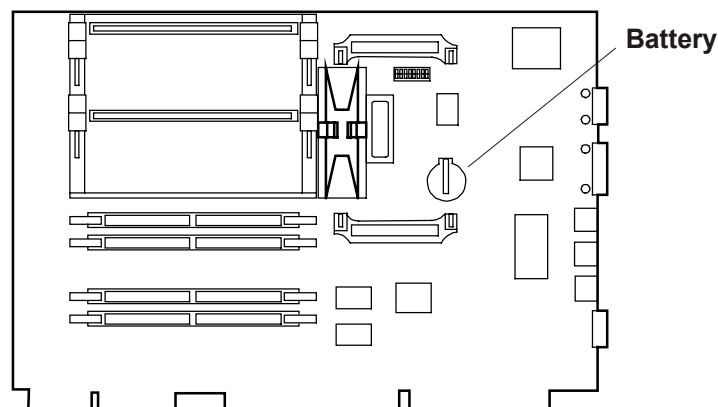
**CAUTION** Do NOT pull on the VRM heat sinks. Grasp the module by the edges of the PCB (printed circuit board).



#### VRM Removal/Replacement

10. Align the replacement VRM over the socket and gently press down.
11. Ensure the latches are in the closed position.
12. Re-assemble the HP NetServer and test.

## Replacing the System Battery



System Board – Battery Location

The installation procedure is the same for the rack-mount and the pedestal HP NetServers once you gain access to the system board assembly.

1. Log off all users and gracefully shut down the network operating system according to directions in your NOS documentation.
2. Power down the HP NetServer.
3. Disconnect the power cords and cables, and if necessary, label each one to support re-assembly.

**CAUTION** The power supplies will continue to provide standby current to the NetServer until the power cable is disconnected.

4. For both rack-mounted and pedestal models, gain access to the system board assembly.

**NOTE** In the rack-mounted version, this assembly is under the right cover, in the pedestal version, it is under the top cover.

**WARNING** Always disconnect the power cords before removing the covers, to avoid exposure to high energy levels that may cause burns when parts are short-circuited by metal objects such as tools or jewelry. Disconnect any telephone cables to avoid exposure to shock hazard from telephone ringing voltages.

5. Remove the two screws securing the system board assembly to the chassis.
6. Unlatch the blue retaining latches to release the assembly.
7. Pull the assembly out until it clears the chassis guides.

**CAUTION** The system board assembly weighs approximately 20 lbs. Have someone help you. One person can do it, but it is easier with two.

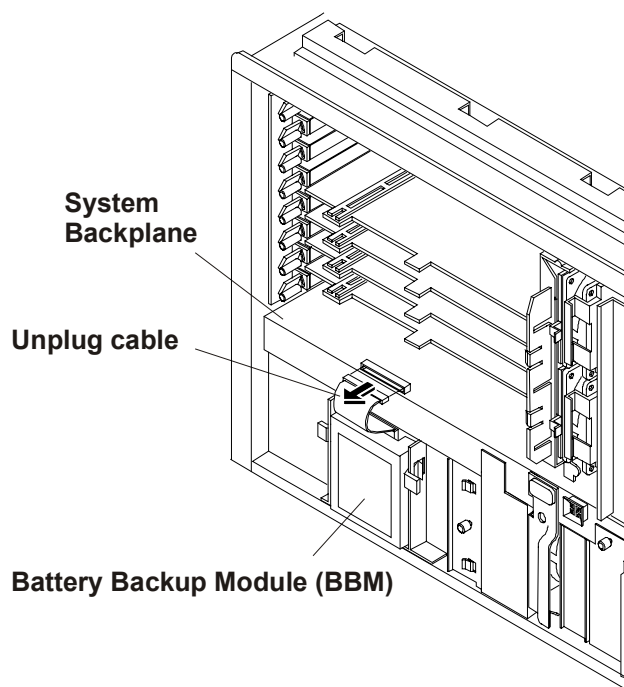
8. Slide the system board assembly from the chassis and place it metal plate side down on an anti-static pad
9. Note the polarity of the battery and the orientation of the battery in the battery holder.
10. Lift the clip holding the battery in the battery holder and remove the battery.
11. Install new the battery in the battery holder.
12. Reinstall any adapter boards you removed.
13. Carefully reinsert the system board assembly into its guides, and reseal it into its socket by rotating the blue latches to the flat, locked position.
14. Replace the two screws securing the system board assembly to the chassis.
15. Close up the HP NetServer.
16. Reconnect power cords and cables.
17. Restore HP NetServer to normal operation.  
Reset the time and date if necessary.

This completes your battery installation.

**CAUTION** Dispose of the old battery in accordance with your local environmental regulations.



## Replacing the NetRAID Battery Backup Module (Optional)



### Battery Backup Module Location

The installation procedure is the same for the rack-mount and the pedestal HP NetServers once you gain access to the I/O side of the chassis.

1. Log off all users and gracefully shut down the network operating system according to directions in your NOS documentation.
2. Power down the HP NetServer.
3. Disconnect the power cords and cables, and if necessary, label each one to support re-assembly.

**CAUTION**

The power supplies will continue to provide standby current to the NetServer until the power cable is disconnected.

4. For both rack-mounted and pedestal models, gain access to the I/O side of the chassis.

**NOTE**

In the rack-mounted version, the I/O is under the top cover, in the pedestal version, the I/O is under the left cover.

**WARNING**

Always disconnect the power cords before removing the covers, to avoid exposure to high energy levels that may cause burns when parts are short-circuited by metal objects such as tools or jewelry. Disconnect any telephone cables to avoid exposure to shock hazard from telephone ringing voltages.

5. Unplug the cable from the I/O board.
6. Release the battery backup module from the chassis by pressing on both latches to release the module.

7. Pull the module out until it clears the chassis.
8. Remove the cable from the module.
9. Remove the replacement battery backup module from the shipping container.
10. Install one end of the cable to the battery backup module.
11. Install the battery backup module into the chassis bracket.
12. Connect to other end of the cable to the socket on the I/O board.
13. Close up the HP NetServer.
14. Reconnect power cords and cables.
15. Restore HP NetServer to normal operation.

This completes your battery backup module installation.

**CAUTION**

Dispose of the old battery in accordance with your local environmental regulations.

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